NM1 - ___30___

MODIFICATION SITE ASSESSMENT

2008-2007

Jones, Brad A., EMNRD

To: Price, Wayne, EMNRD

Subject: RE: Minutes of meeting with Artesia Aeration NM-1-30

Artesia Aeration (AA) contacted Wayne Price last week to schedule a meeting regarding the modification (to install landfill cells) of their existing landfarm permit. OCD was under the impression that the meeting would be to address technical issues regarding the ground water investigation of the proposed expansion. OCD's expectations were based on a Feb. 21, 2008 request for such a meeting. Larry Parker, Jim Wilson with AA arrived this morning (April 21) to present OCD (Wayne Price and Brad Jones) with a permit application, instead of the technical meeting. Mr. Wilson and Mr. Parker made a special trip to Santa Fe to present the application. At the last meeting OCD pointed out several deficiencies in their application, and AA decided it was in their best interest to withdraw the application. The previously identified deficiencies were still present in the application submitted today. OCD accepted the application provided this morning.

The meeting today was short lived as OCD pointed out some of the same deficiencies as was noted before. Mr. Jim Wilson became visibly up-set and left the meeting prematurely. OCD will put together a detail letter describing the issues of concern regarding the application.

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From: Price, Wayne, EMNRD
Sent: Monday, April 21, 2008 10:52 AM
To: Jones, Brad A., EMNRD
Subject: Minutes of meeting with Artesia Aeration NM-1-30

Artesia Aeration (AA) requested another technical meeting concerning modifying their existing landfarm application to install Landfill cells. The meeting was attended by Larry Parker, Jim Wilson with AA and Wayne Price, Brad Jones of the OCD. Mr. Wilson and Mr. Parker made a special trip to Santa Fe to present the application. At the last meeting OCD pointed out several deficiencies in their application, and AA decided it was in their best interest to withdraw the application.

The meeting today was short lived as OCD pointed out some of the same deficiencies as was noted before. Mr. Jim Wilson became visibly up-set and left the meeting prematurely. OCD will put together a detail letter describing the issues of concern.

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DRAFT

Groundwater Investigation Report
Artesia Aeration
Section 7, Township 17S, Range 32E
Lea County, New Mexico

January 2008

Prepared for:

Artesia Aeration
5614 Lovington Highway
Hobbs, NM 88240

By:

Safety & Environmental Solutions, Inc.
703 E. Clinton Suite 102
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I. Introduction

The report presents the results of geologic and groundwater investigation at the Artesia Aeration facility, which is located in Section 7, Township 17S, Range 32E, Lea County, New Mexico. The facility location is located on private land approximately two miles west of the unincorporated community of Maljamar and is adjacent to and on the north side of US Highway 82. The location of the facility is shown in Figure 1.

II. Background

Artesia Aeration is an NM Oil Conservation Division (OCD) facility approved for the land farm remediation of hydrocarbon-contaminated soil resulting from current and past spills, leaks or other releases of petroleum hydrocarbon associated with the drilling and production of oil and natural gas. The facility desires to receive for long-term encapsulation salt-contaminated solids and soil resulting from drilling operations and produced water spills and leaks from said operations. The facility is preparing an application for submittal to the OCD for approval to receive such materials. The salt contaminated solids will be placed in lined pits with a maximum depth, including liners, of 25 ft. beneath the land surface. The maximum area within the facility where such proposed pits may be located is shown on Figure 2, the topographic survey, as "Proposed Expansion Area".

As part of the application, Artesia Aeration is providing the OCD with information on the geologic environment and groundwater, or lack thereof, in the vicinity of the proposed pits. Safety and Environmental Solutions, Inc., was engaged to supervise drilling and installation of a monitor wells and including a deep boring whose dual purpose is to provide lithologic information and serve as a monitoring well.

III. Geologic Setting

Lea County is divided approximately in half by an escarpment known as the Mescalero Ridge. This feature is oriented from northwest to southeast. To the east of the escarpment, the landscape is flat or only slightly undulating and is known as the High Plains. The escarpment itself consists of a cliff face capped by a thick layer of caliche known as the Caprock and may be as high as 150 feet. The caprock is the top of the Ogallala formation which is a sedimentary formation of Tertiary geologic age consisting mainly of sand, poorly to well cemented with calcium carbonate (i.e. sandstone), and some silts and clays. Its major feature is the layer of caliche which caps the formation most everywhere.

To the west of the escarpment, the landscape is dominated by irregular topography consisting of sandy alluvium and caliche deposits. This material is of rather recent geologic origin (Quaternary). The Artesia Aeration facility is just over two miles to the southwest of the escarpment and sediments in the immediate area of the facility are likely from erosion of the Ogallala material.

Beneath the Quaternary sediments at a depth of 30 to 50 feet in the area of Artesia Aeration are Triassic age sediments of the Dockum group known informally as the "redbeds." These rocks consist of claystone, mudstone, siltstone and fine-grained sandstones. Coloring may range from light brown to brown to gray depending on the predominant lithology; however, the most frequent is the reddish-brown color of the claystone and mudstone hence the name "redbeds." The borehole at the facility that was drilled to a depth of 160 feet and completed as a monitor well (MW-3) penetrated

approximately 110 feet of redbeds, and the colors and lithologies described above were observed in the core samples.

IV. Groundwater

Except for some locations in southern Lea County, potable groundwater is provided by wells located in the Ogallala formation. However groundwater is generally absent in the area to the west of the Ogallala caprock at Maljamar. The lack of potable groundwater west of the caprock has been documented in several reports by the NM Bureau of Mines and the US Geological Survey (see Section VI, References).

A search of New Mexico State Engineer Office and US Geological Survey records did not locate any water wells within two miles of the facility. The closest well found was located 2.3 miles north in Taylor Draw, an alluvial channel draining south from the escarpment. The depth to water was reported as 45 ft. in 1996. In the vicinity of Maljamar several wells were listed in the 1961 Southern Lea County groundwater report. However, with one exception they are shown as being on the Caprock. The one well in the alluvium was located near the Maljamar post office and had a depth to water of 83 ft. in 1954. The location of this well and the Taylor Draw well are shown on Figure 3. East of Maljamar, on the caprock, water wells are numerous; however these wells are located a distance of four miles or greater from the facility and are not mapped.

V. Site Investigation

In May 1999 a single monitoring well located near the entrance to the property (see Figure 2, the topographic survey, showing the location of that well, MW-D1) was drilled to a depth of 120 ft. and completed open hole with no casing or screen below about 20 ft. The lithology reported in the log to the NM State Engineer Office showed sand to 25 ft., green clay to 40 ft. and red clay, green clay and caliche to total depth. No water was encountered. Recent measurements indicate the hole has caved or bridged at a depth of 76 ft. below the top of casing.

Beginning in 2005 a series of boreholes was drilled on the property some of which were completed as monitor wells (the lithologic/completion logs for these wells are shown in the Appendix). Monitor well MW-1, also located near the entrance, encountered brown clay at 23 ft. and various clay and claystone to a depth of 35 ft. No groundwater was found. The borehole was backfilled to 25 ft. and completed as a monitor well which remains dry.

MW-2 is located at the south end of, and between, cells 5 and 6. The well is adjacent to the Highway 82 bar ditch and shows a thin saturated zone on top of red bed clays that may be due to infiltration from intermittent ponded water in the nearby highway bar ditch. A fresh water line is also present between the well and the highway ROW fence. Water levels and water quality for this well are shown in Tables 1 and 2.

Borehole BH-3 was located south of MW-2 between the well and the water line. It was thought that if a water line leak was responsible for the water seen in MW-2, a boring between the line and MW-2 might detect it. However the boring was dry to total depth of 30 ft. Redbeds were located at a depth of 26 ft. at this location.

At the request of the OCD, a third monitor well was drilled in the northwest area of the facility. Lithology to a depth of 50 ft. was determined using a 5 ft. core barrel inside a hollow stem auger. However, the drilling rig was not able to penetrate more than five feet into the consolidated sedimentary formation which begins about 45 ft. below the land

surface. The logs for the first 50 ft. at the MW-3 location are shown as MW-3-1 and MW-3-3. The lithology above 45 ft. was predominately sand with caliche near the surface. From 45-50 ft. the lithology changed to the type commonly associated with the "redbed," that is fine grained clay, claystones, mudstones and sandstones.

From 50 ft. to a total depth of 160 ft., the lithology was determined using an air rotary drilling rig that equipped with a 5 ft. diamond-tipped coring bit. Because the top lithology was generally loose sand, a 9-7/8 in. pilot hole was drilled to 50 ft and lined with a temporary 6-in. PVC surface casing. Below that, diamond bit cored samples whose length before core refusal varied between 2 and 5 ft. with the average length approximately 4 ft.

The lithology for this portion of the borehole (MW-3-2) was generally redbeds from 45 to 52 ft., a light brown fine-grained, well cemented sandstone between 52 and 108 ft., sandstone mixed with clay, mudstone and claystone to 126 ft., and clay and claystone "redbeds" to 160 ft. A composite of all the logs is shown on MW-3 Composite in the Appendix. The discovery of 56 ft. of light brown cemented sandstone in the borehole was not expected and could indicate that the material is from the Triassic Chinle formation, a component of the Dockum group.

After consultation with the on-site OCD representative, Mr. Brad Jones, the boring was backfilled from 160 ft. to 140 ft with bentonite capped with 1 ft. of sand for a well base. It was completed as a monitor well with a screened interval from 129 to 139 ft. The well has sand opposite the screen to 127 ft., bentonite chips (un-hydrated) to 117.5 ft. and cement grout to the surface. It is completed with an above-grade locking steel protection casing and a concrete pad. Measurements taken on December 13, 15 and 18, 2007 and on January 15, 2008 show no water or moisture in the monitor well.

VI. Conclusions

The following can be concluded as a result of the investigation:

1. A review of State Engineer, US Geological Survey and available groundwater reports show no groundwater wells within two miles of the facility. Groundwater is found further to the east associated with the Ogallala formation.
2. At the facility, shallow unconsolidated alluvial sediments exist from the surface to a depth of 25 to 45 ft. beneath the site. These are mainly sands with caliche present nearer the surface.
3. Beneath these sediments a series of consolidated and semi-consolidated fine-grained sedimentary deposits exist consisting of claystones, mudstones, sandstone and clay. The existence of over 50 ft. of well cemented sandstone was unexpected and could indicate the sediments are part of the Chinle formation, a component of the Dockum group.
4. The investigation determined that no alluvial or deeper groundwater exists at MW-3 to a depth of 160 ft.
5. Previously MW-1 did not detect groundwater when drilled to a depth of 35 ft. and continues to be dry at its completion depth of 25 ft.
6. Boreholes 3 and 4, which were not completed as monitor wells, did not detect groundwater at a depth of 30 ft.
7. Monitor well MW-2 contains groundwater with a current saturated thickness of 2.5 ft. However, the well was completed 5 ft. into the thick gravelly silty-clay zone

at the base of the sand zone. The source of this water is unknown, but maybe related to ponded water in the nearby bar ditch on the north side of the highway. The water level appears to fluctuate depending the amount of precipitation, especially heavier precipitation related to summer thunderstorms. The highest water level (saturated thickness 7.1 ft.) was measured in August of 2005 which the season of the summer monsoon.

8. The lack of groundwater at the facility, except at MW-2 as noted above, demonstrates the suitability for its current and proposed use, especially with the engineering controls (synthetically-lined impoundments) that will be part of facility design.

VII. References

Ash, S.R., 1963. Ground-water conditions in northern Lea County, New Mexico: U.S. Geological Survey, Hydrologic Investigations Atlas, HA-62, 2 plates.

Nicholson, A. Jr., and Clebsch, A. Jr., 1961. Geology and ground-water conditions in southern Lea County, New Mexico: N. Mexico Institute of Mining and Technology, State Bureau of Mines and Mineral Resources Ground Water Report #6, 123 p.

Water well records on file with the Office of the New Mexico State Engineer and the US Geological Survey.

VII. Tables and Figures

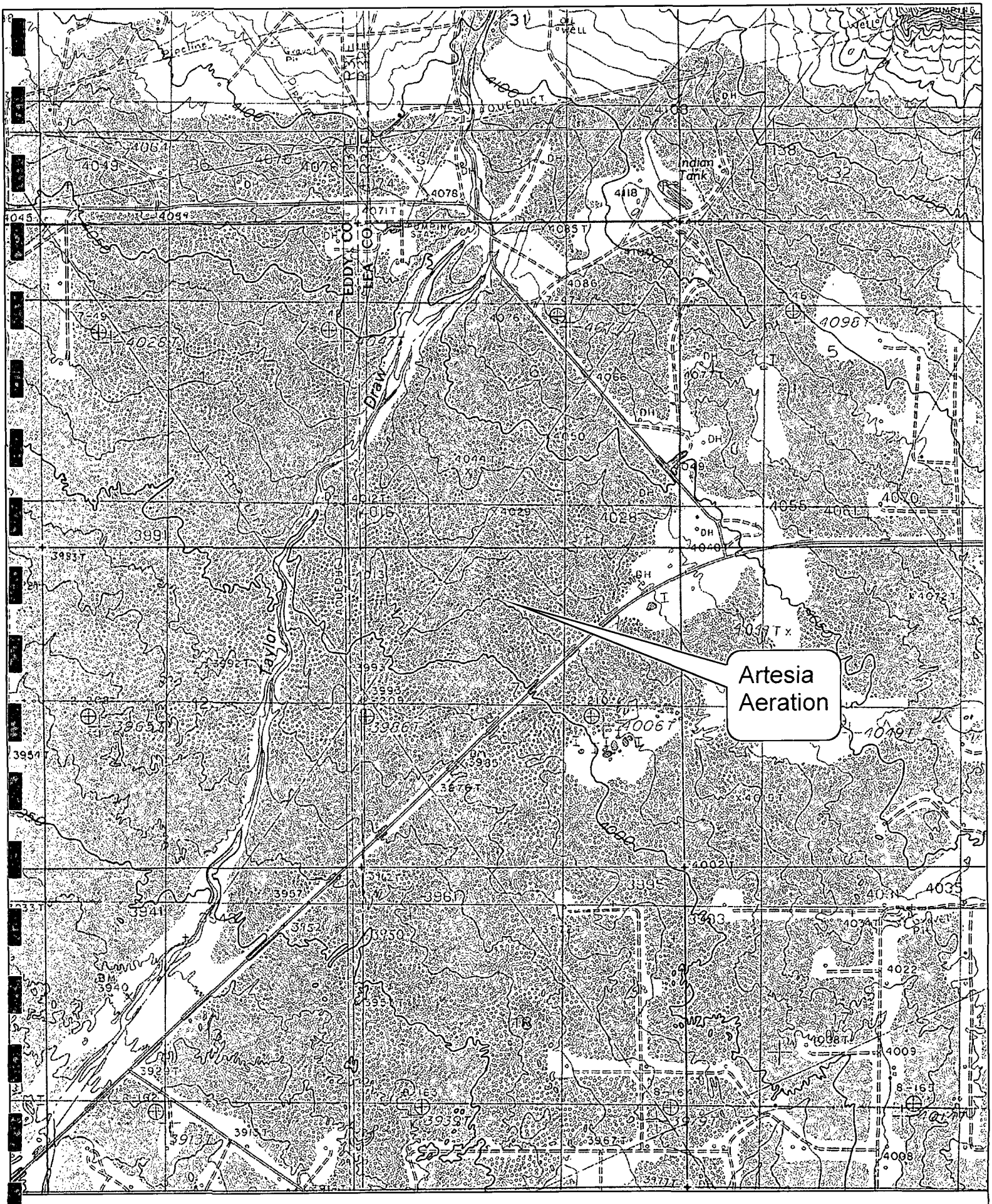
Table 1. Water Level Measurements, Artesia Aeration, Lea County, New Mexico

Monitor Well Name, Total Depth Below TOC (feet)	Elevation Top of Casing (feet)	Ground Level Elevation (feet), Note	Date Measured	Depth to Water Below TOC (feet)	Water Level Elev. (feet)	Water Saturated Thickness (feet)	Water Level Change (ft)
MW-1	4,036.21	4,032.91	05/21/05	Dry	--	--	--
27.81			06/01/05	Dry	--	--	--
			06/03/05	Dry	--	--	--
			06/08/05	Dry	--	--	--
			06/29/05	Dry	--	--	--
			07/12/05	Dry	--	--	--
			07/14/05	Dry	--	--	--
			07/22/05	Dry	--	--	--
			07/26/05	Dry	--	--	--
			08/02/05	Dry	--	--	--
			08/05/05	Dry	--	--	--
			08/09/05	Dry	--	--	--
			12/15/05	Dry	--	--	--
			08/13/07	Dry	--	--	--
			10/26/07	Dry	--	--	--
			01/15/08	Dry	--	--	--
MW-2	4,015.60	4,012.42	05/29/05	24.49	3,991.11	3.6	--
28.06		*	06/01/05	24.59	3,991.01	3.5	-0.10
		*	06/03/05	24.56	3,991.04	3.5	0.03
		*	06/08/05	24.66	3,990.94	3.4	-0.10
		*, 10:30 am	06/29/05	24.97	3,990.63	3.1	-0.31
		*, 3:45 pm	06/29/05	25.24	3,990.36	2.8	-0.27
		*	07/12/05	25.22	3,990.38	2.8	0.02
		*	07/14/05	25.24	3,990.36	2.8	-0.02
		*	07/22/05	25.39	3,990.21	2.7	-0.15
		*	07/26/05	25.43	3,990.17	2.6	-0.04
		*	08/02/05	21.60	3,994.00	6.5	3.83
		*	08/05/05	21.07	3,994.53	7.0	0.53
		*	08/09/05	21.01	3,994.59	7.1	0.06
			12/15/05	23.33	3,992.27	4.7	-2.32
		*	08/13/07	24.35	3,991.25	3.7	-1.02
			10/26/07	25.11	3,990.49	3.0	-0.76
		*	01/15/08	25.58	3,990.02	2.5	-0.47
MW-3	--	4,028.37	12/15/08	Dry	--	--	--
142.15			12/18/07	Dry	--	--	--
142.9			01/15/08	Dry	--	--	--
MW-D1	4,037.08	4,032.40	05/13/99	Dry	--	--	--
124.68			05/21/05	Dry	--	--	--
			08/13/07	Dry - unable to determine total depth			--
76.03			10/26/07	Dry	--	--	--
			01/15/08	Dry	--	--	--
Locations surveyed 08/08/07							
* - Pumped dry after measurement							

Table 2. Water Quality Results, Artesia Aeration, Lea County, New Mexico

Monitoring Well	Sample Date	Chloride (mg/L)	Total Dissolved Solids (mg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Xylenes (total, µg/L)
MW-2	05/29/05	364	1,263	- -	- -	- -	- -
	08/13/07	1,500	4,600	0.5	0.5	0.5	<1.0
	01/15/08	980	3,700	0.5	0.5	0.5	<1.0
NM Groundwater Standard[1]:		**250**	**1,000**	**10.0**	**750**	**750**	**620**
Notes: 1. Water Quality Control Commission Standards adopted by the NM Oil Conservation Division							
2005 analysis performed at Cardinal Laboratories, Hobbs, NM using EPA SW-846 method 160.1 (TDS),							
	and Standard Method 4500-Cl B (Cl)						
2008 Analyses by Argon Laboratories, Hobbs, NM using EPA SW-846 methods 8021B (GC volatile organics),							
	160.1 (TDS) and 300.0 (Cl).						

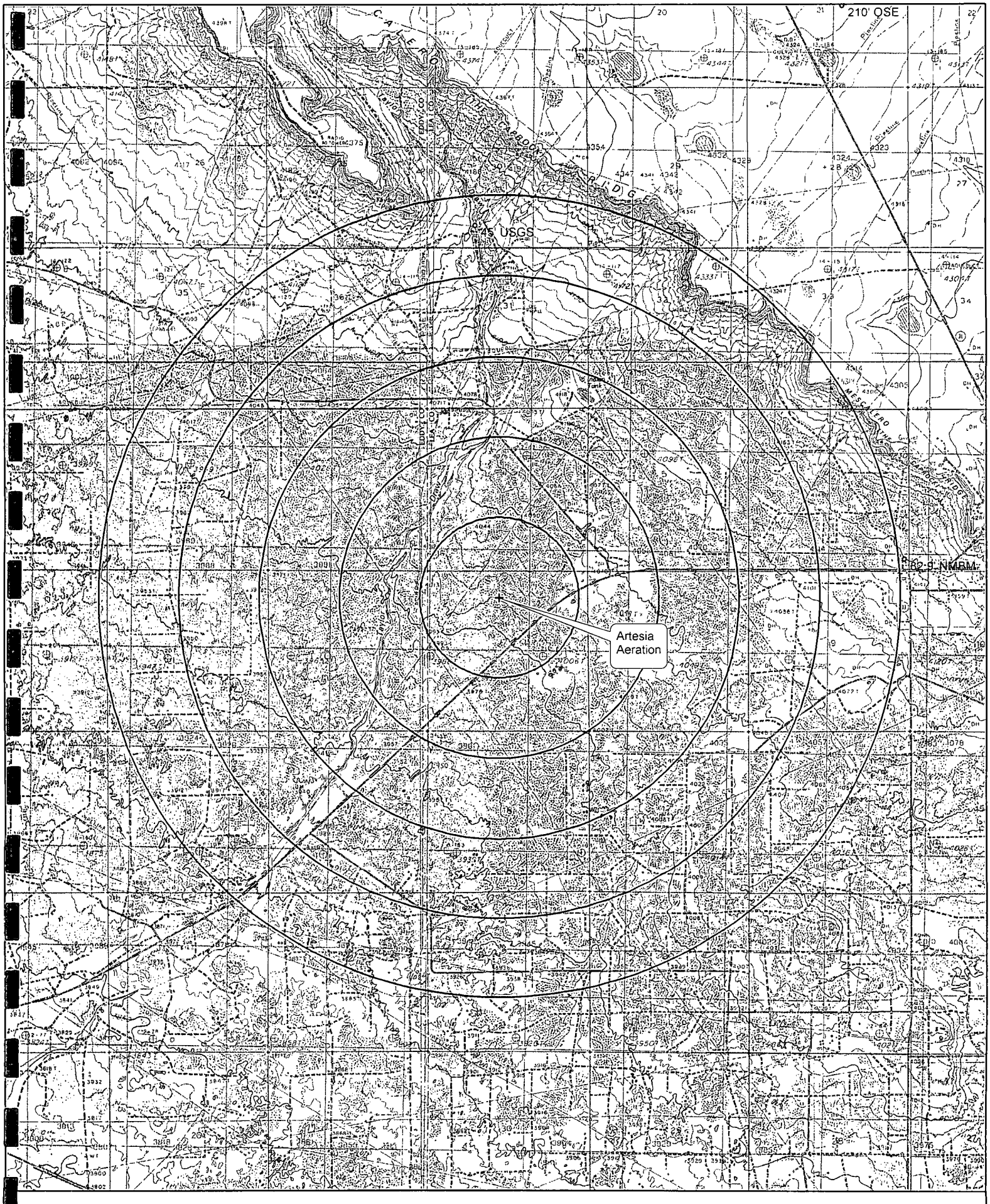
Figure 1. Location Map, Artesia Aeration, Lea County, New Mexico



Name: MALJAMAR
Date: 1/29/2008
Scale: 1 inch equals 2000 feet

Location: 032° 51' 14.23" N 103° 48' 26.25" W NAD 83
Caption: Figure 1. Location Map, Artesia Aeration, Lea County, New Mexico

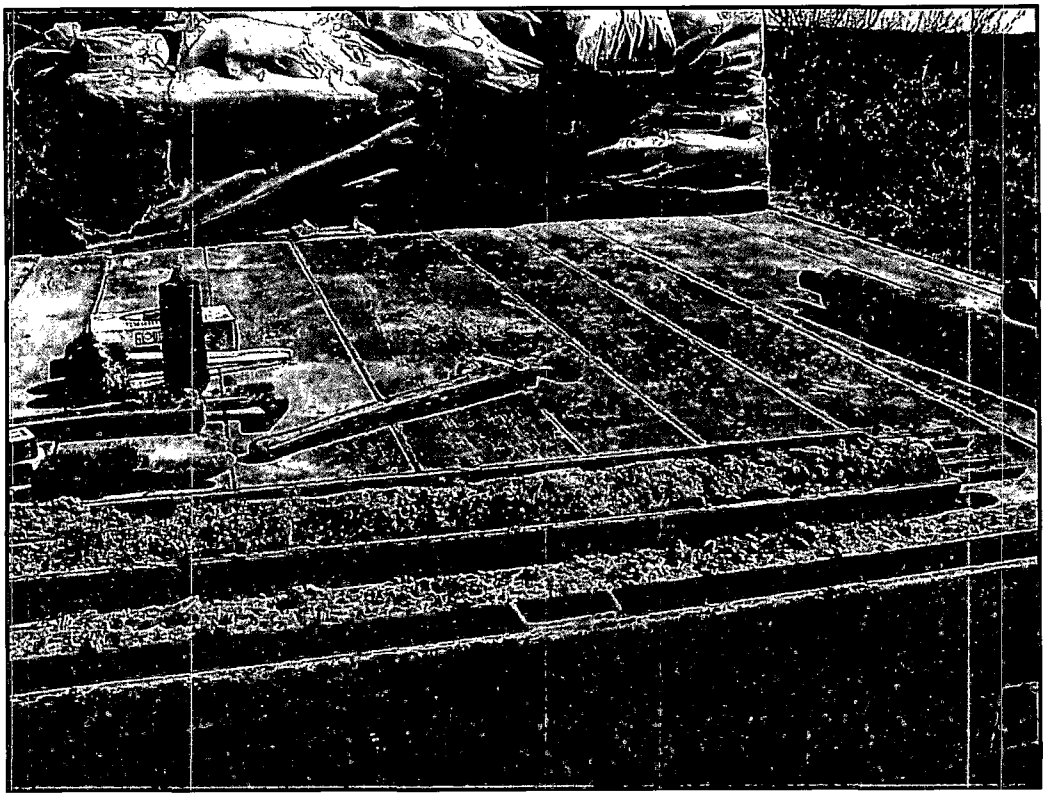
Figure 2. Topographic Survey, Artesia Aeration
Lea County, New Mexico

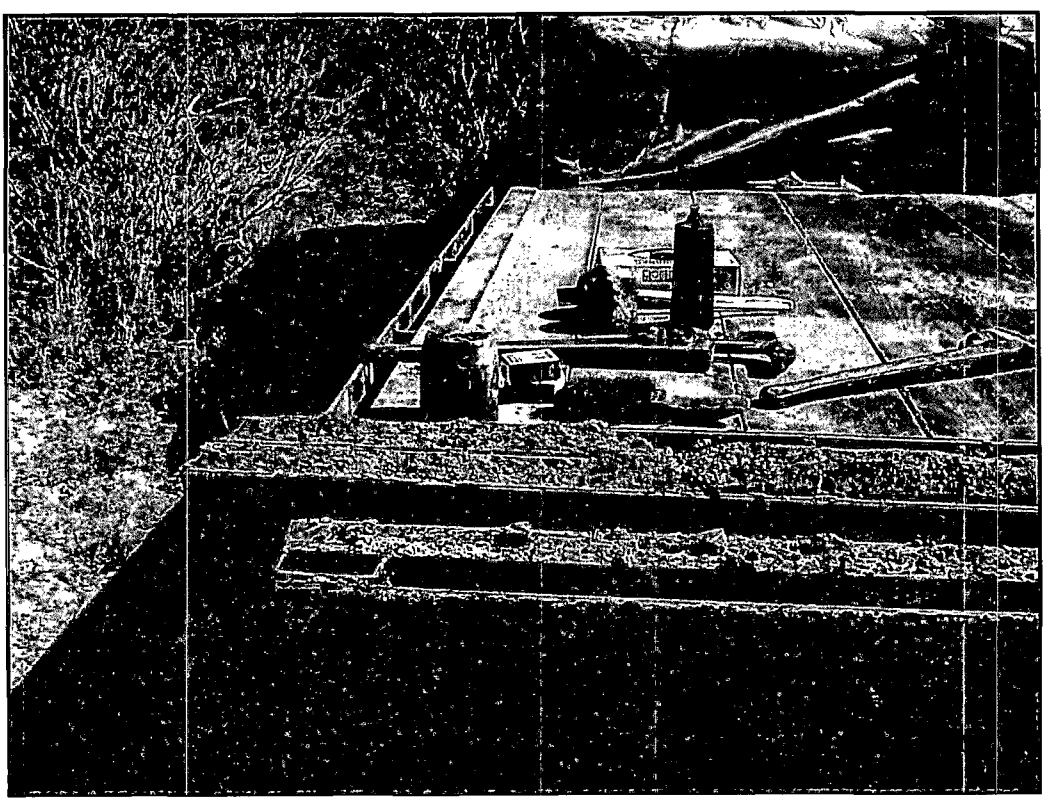


Name: MALJAMAR
Date: 1/29/2008
Scale: 1 inch equals 4000 feet

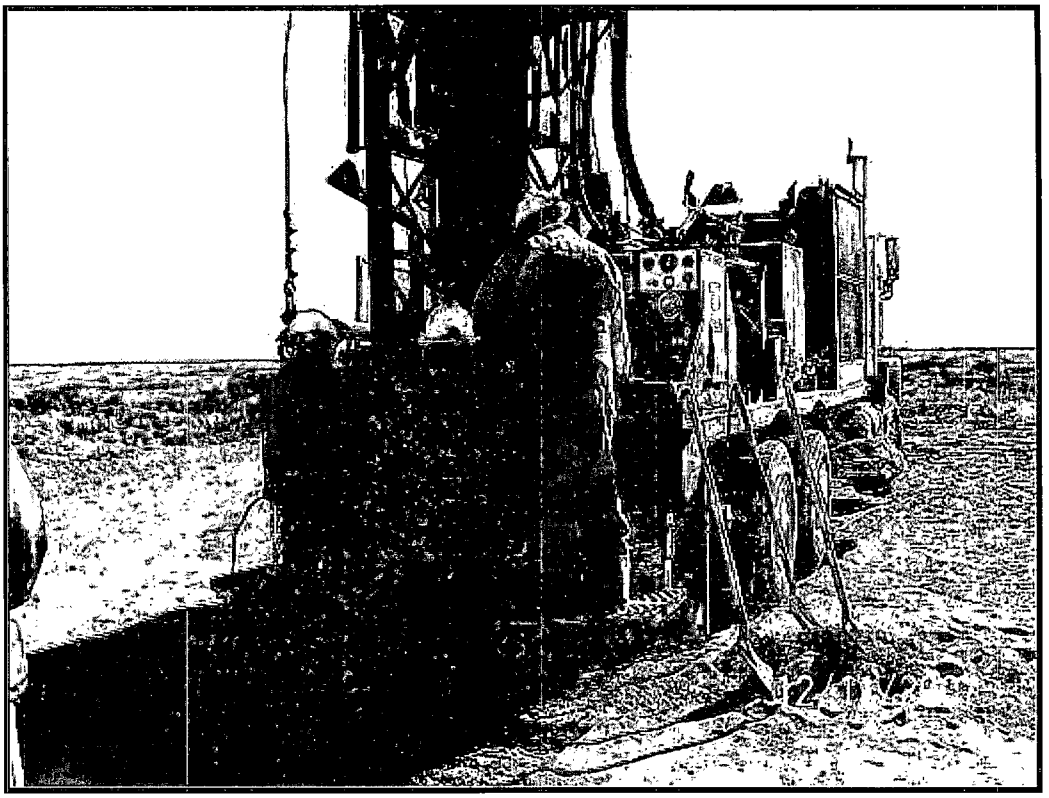
Location: 032° 51' 14.23" N 103° 48' 26.25" W NAD 83
Caption: Figure 3. Location of nearby water wells, Artesia Aeration. Ring interval 0.5 miles

VIII. Appendix - Supporting Information

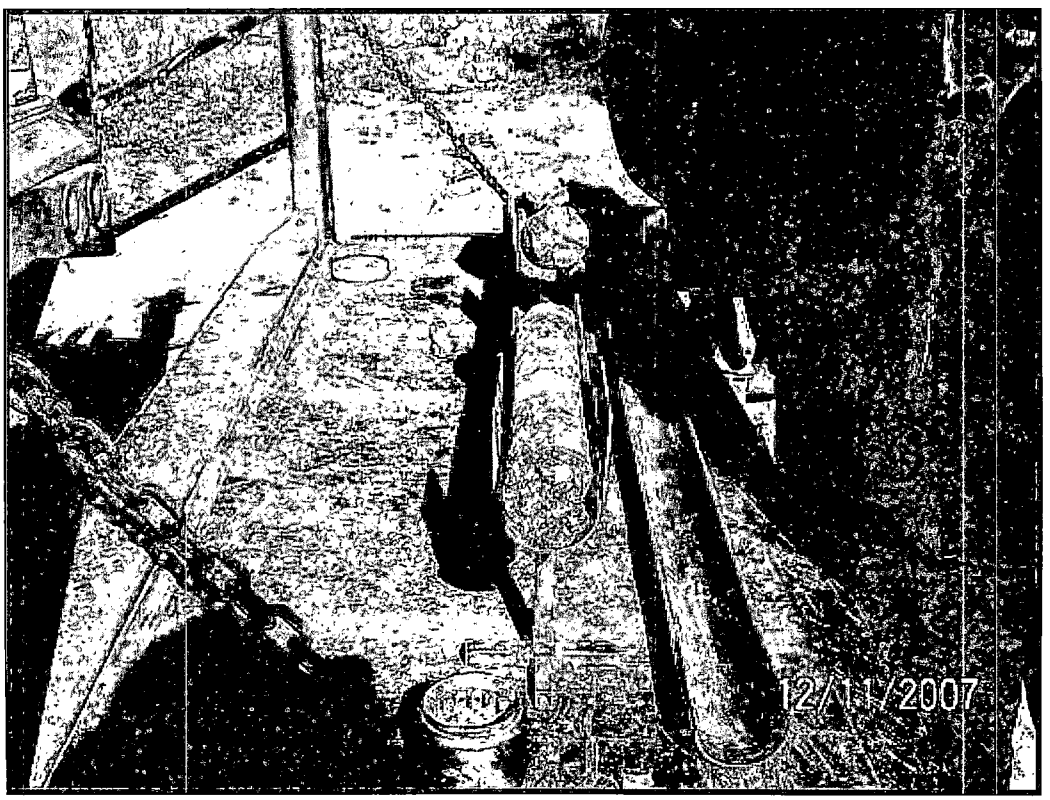




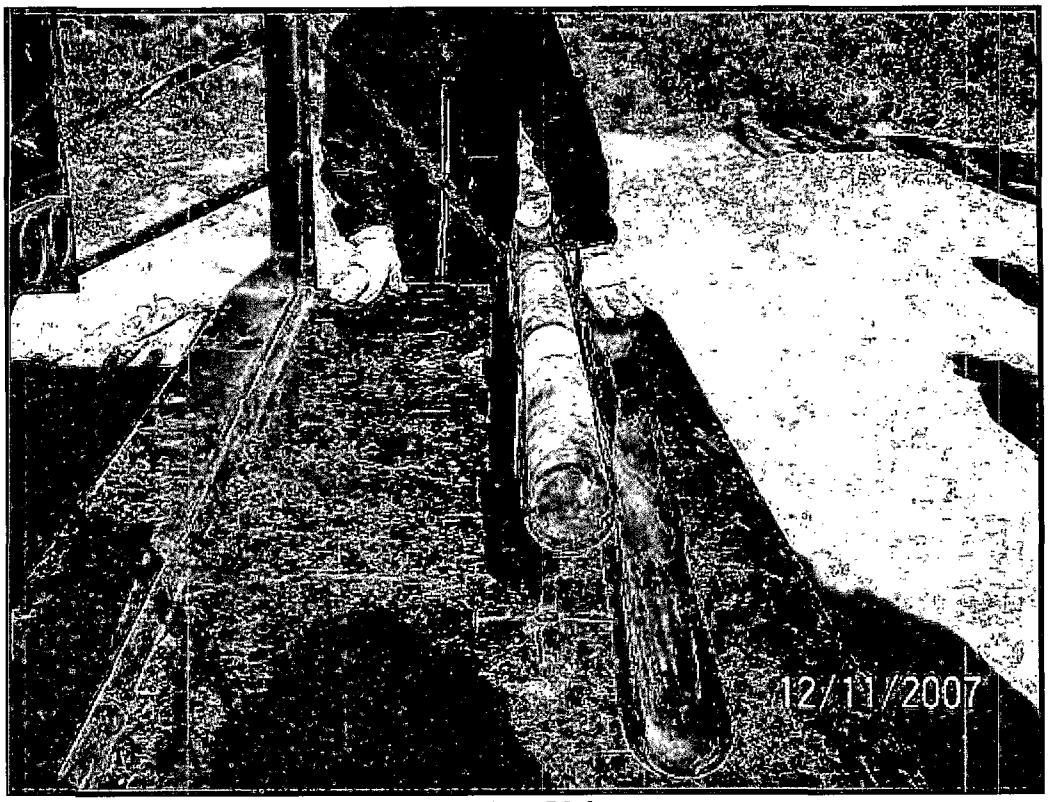
Example of five-foot core barrel sampling method (from an unrelated location)



#1- Drill Rig

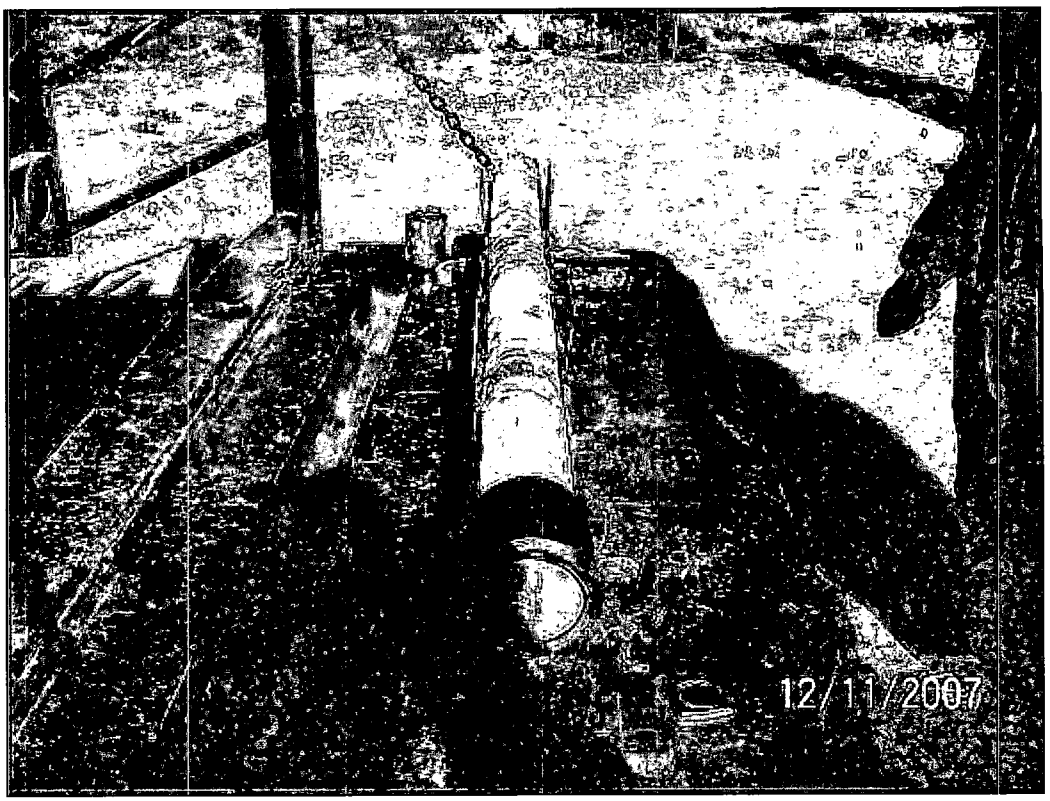


#2- 51 to 53 feet

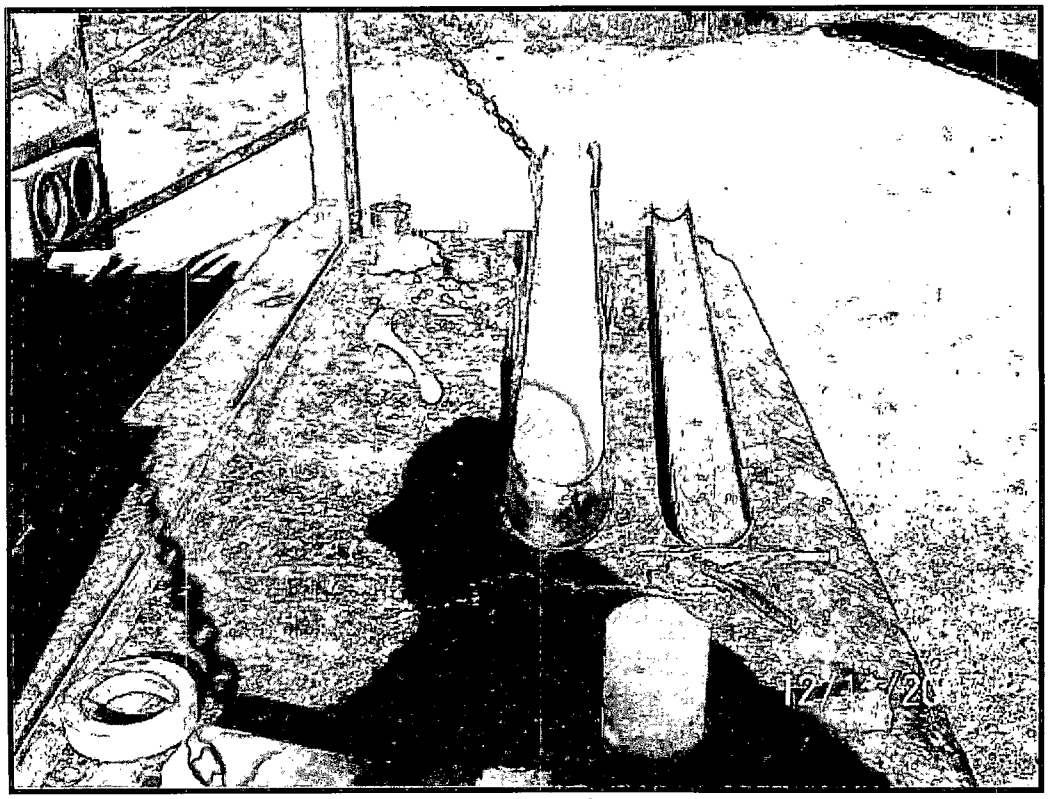


#3- 53 to 56 feet

#4- 56 to 58 feet



#5- 59 to 64 feet

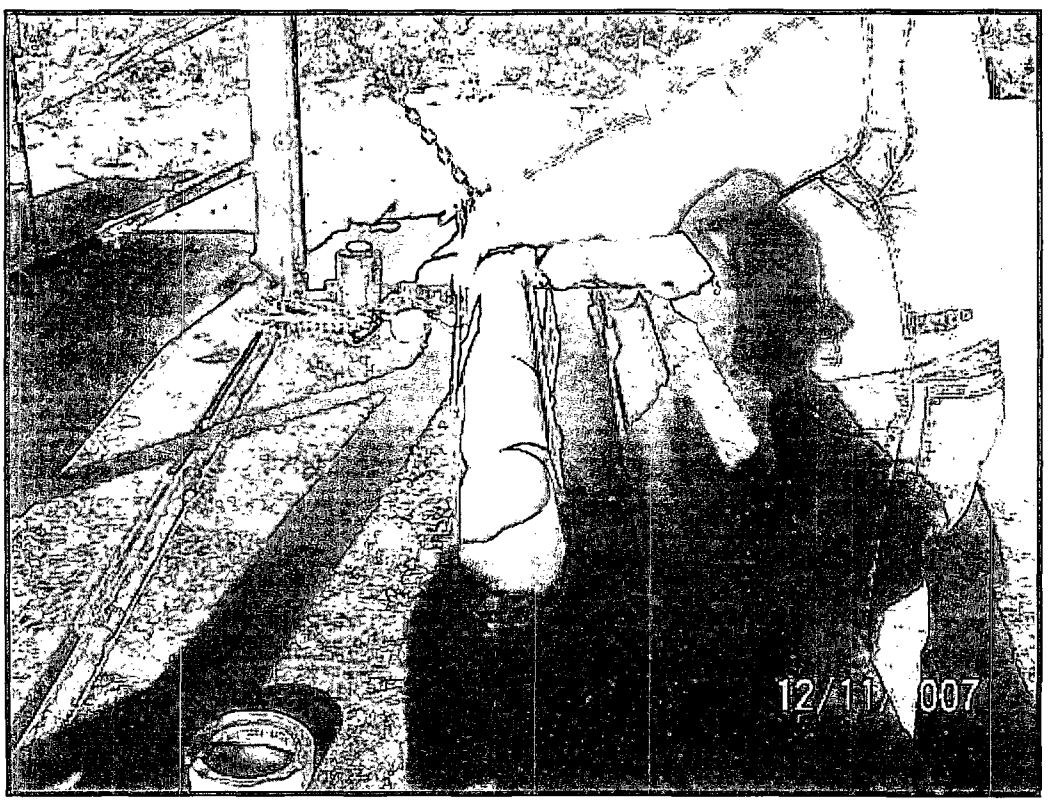


#6- 64 to 69 feet

#7- 69 to 74 feet

#8- 74 to 79 feet

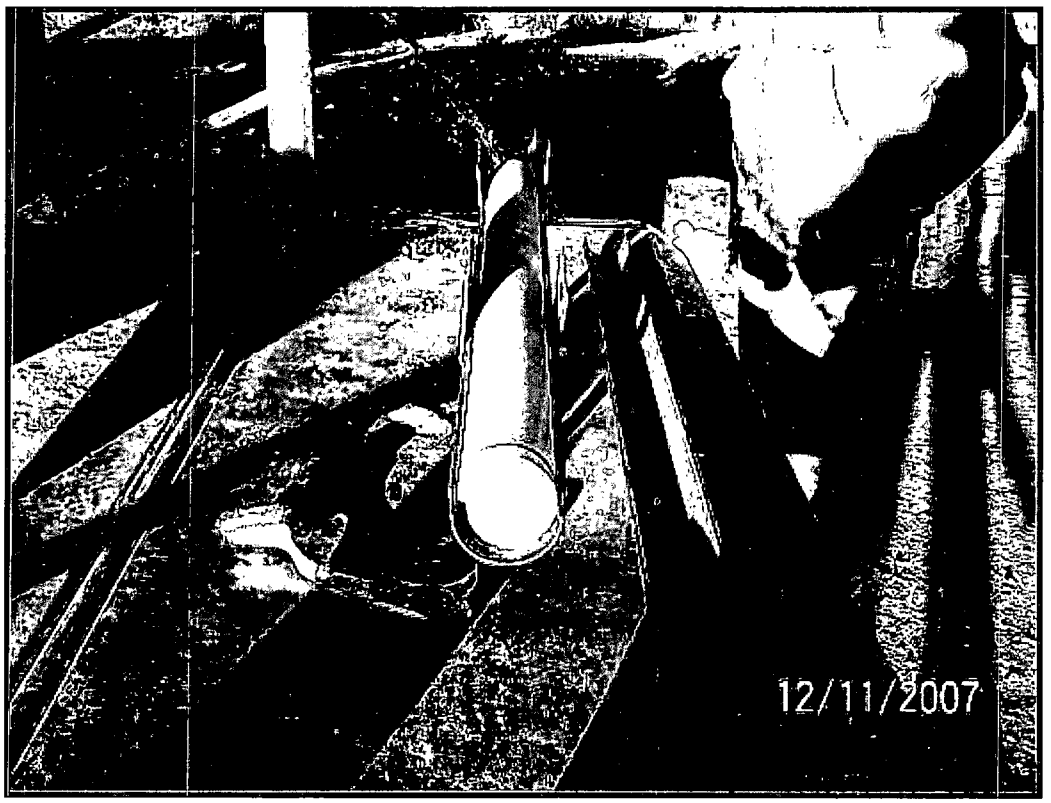
#9- 79 to 84 feet



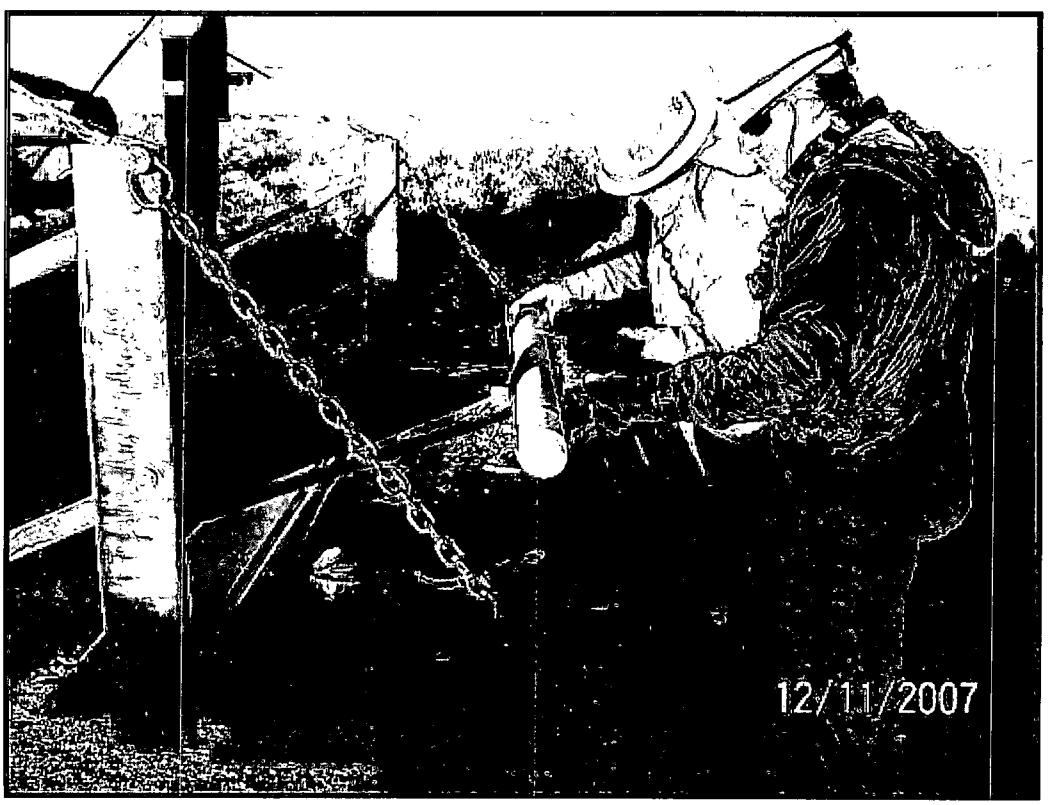
#10- 84 to 88 feet

#11- 88 to 93 feet

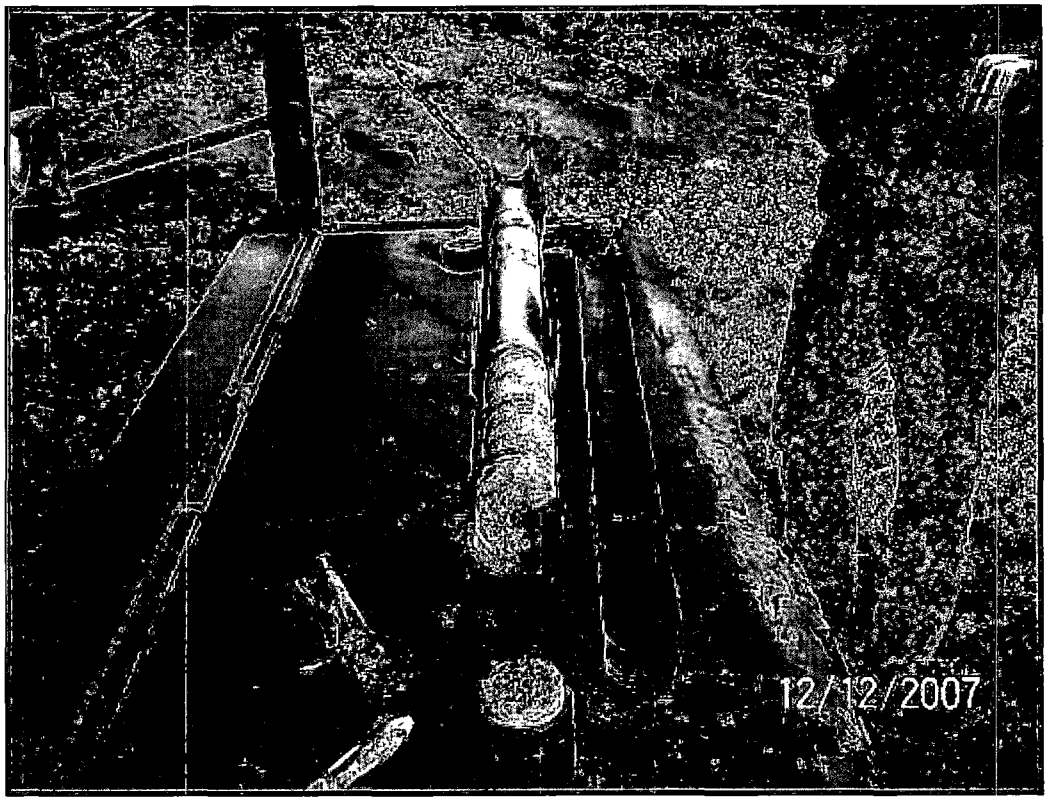
#12- 93 to 98 feet



#13- 98 to 101 feet

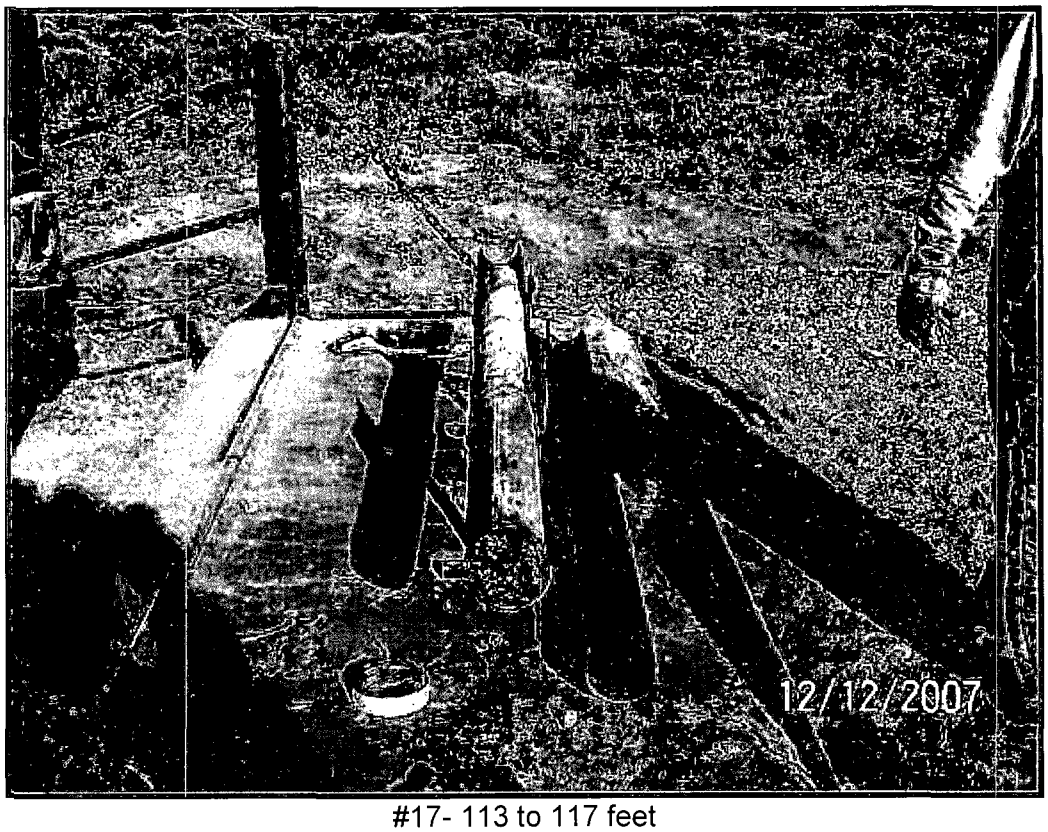


#14- 101 to 105 feet



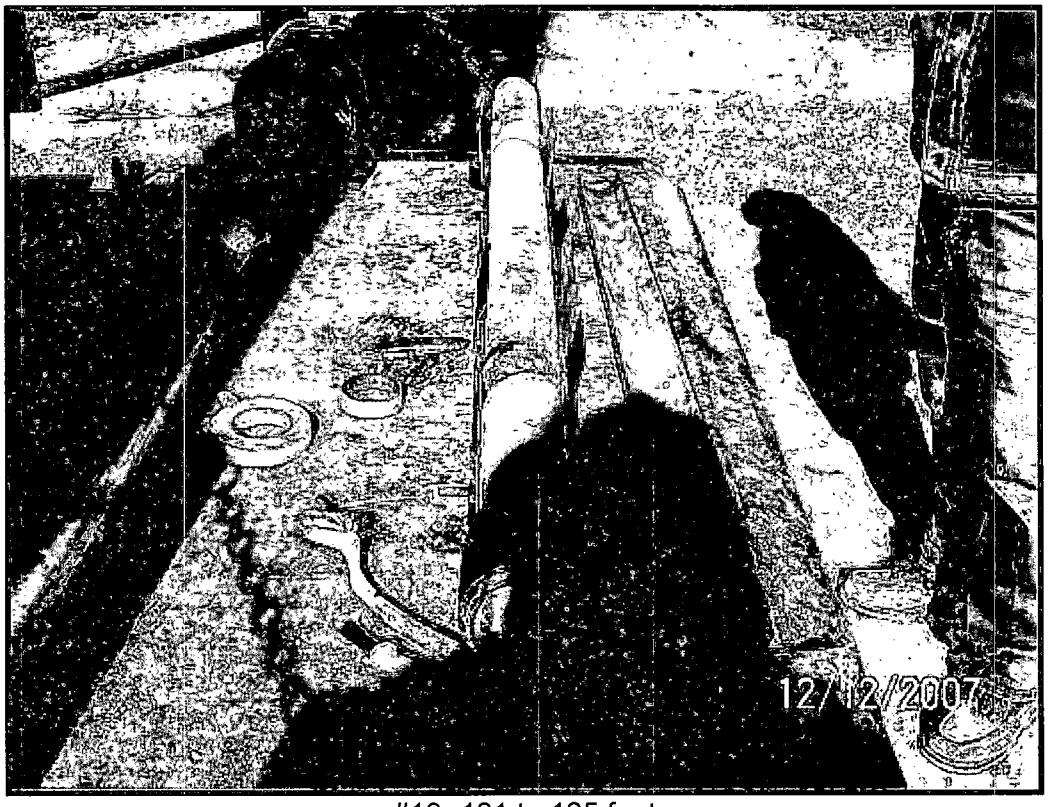
#15- 105 to 109 feet

#16- 109 to 113 feet

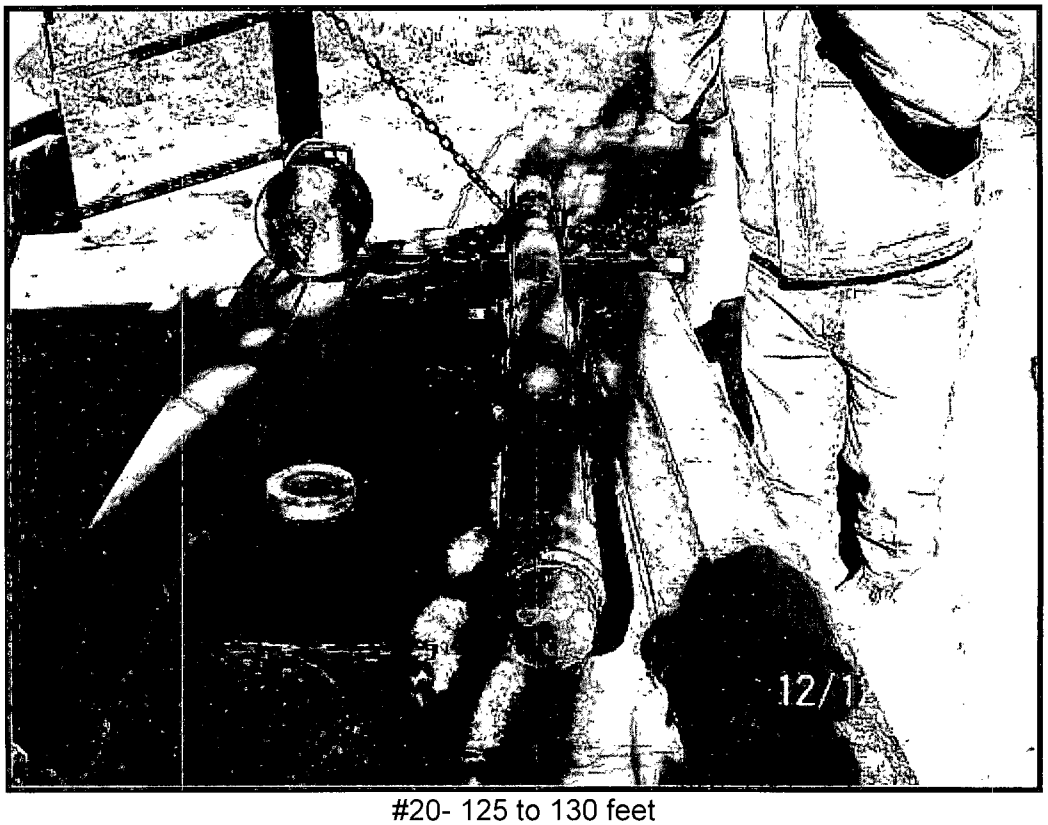


#17- 113 to 117 feet

#18- 117 to 121 feet

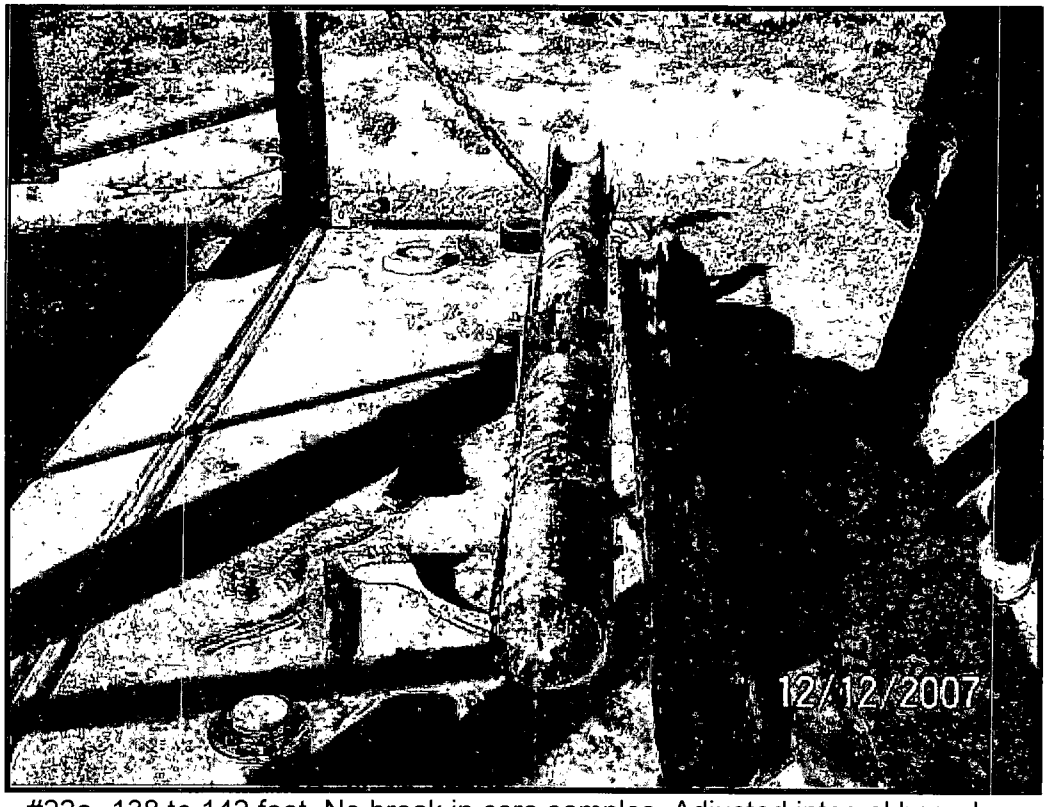


#19- 121 to 125 feet



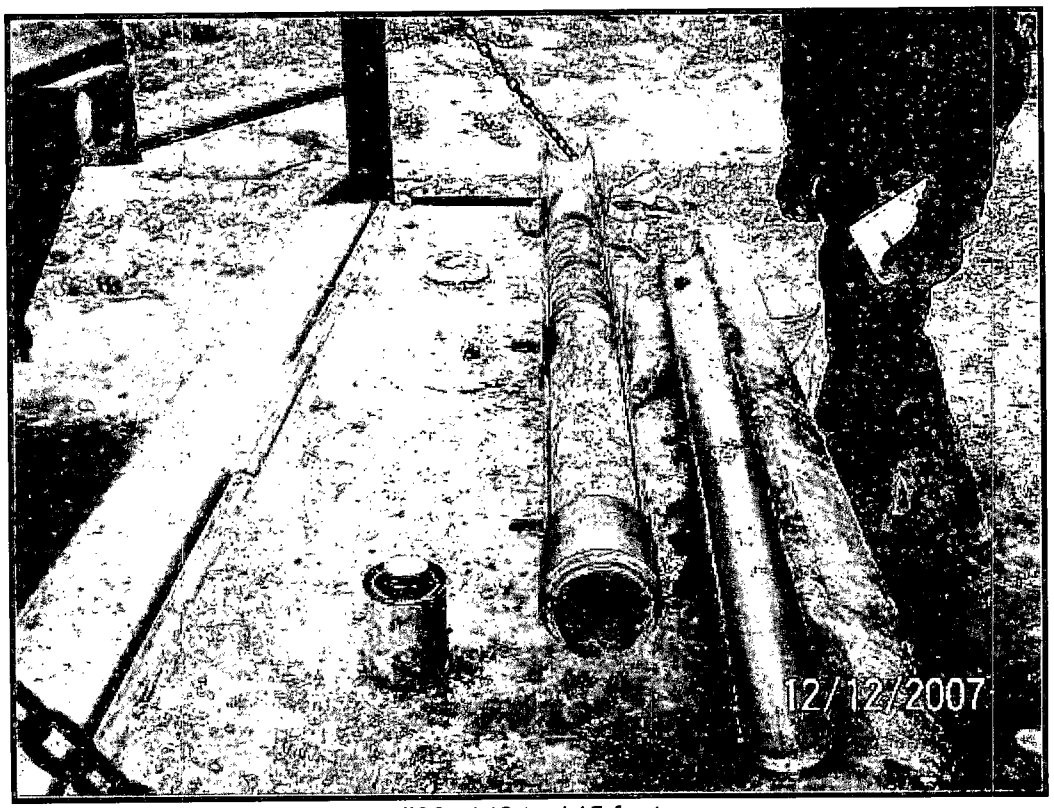
#20- 125 to 130 feet

#21- 130 to 135 feet



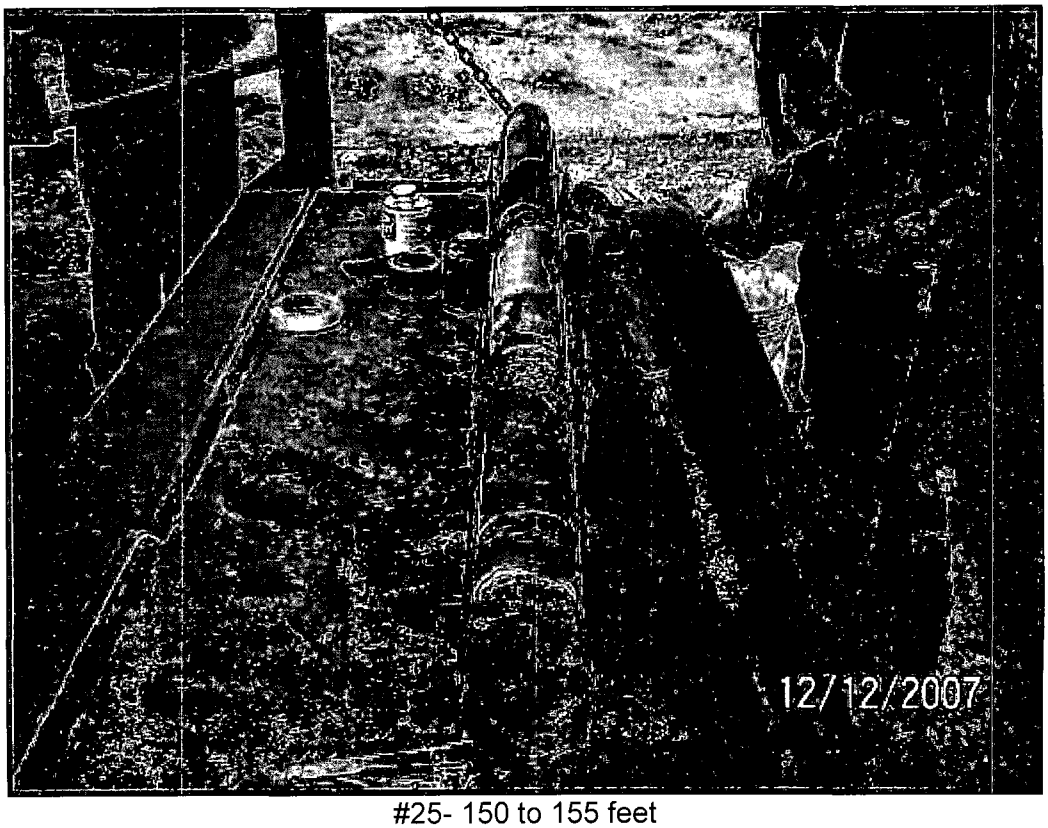
#22a- 138 to 142 feet. No break in core samples. Adjusted interval based on measured depth of borehole.

#22b- 138 to 142 feet

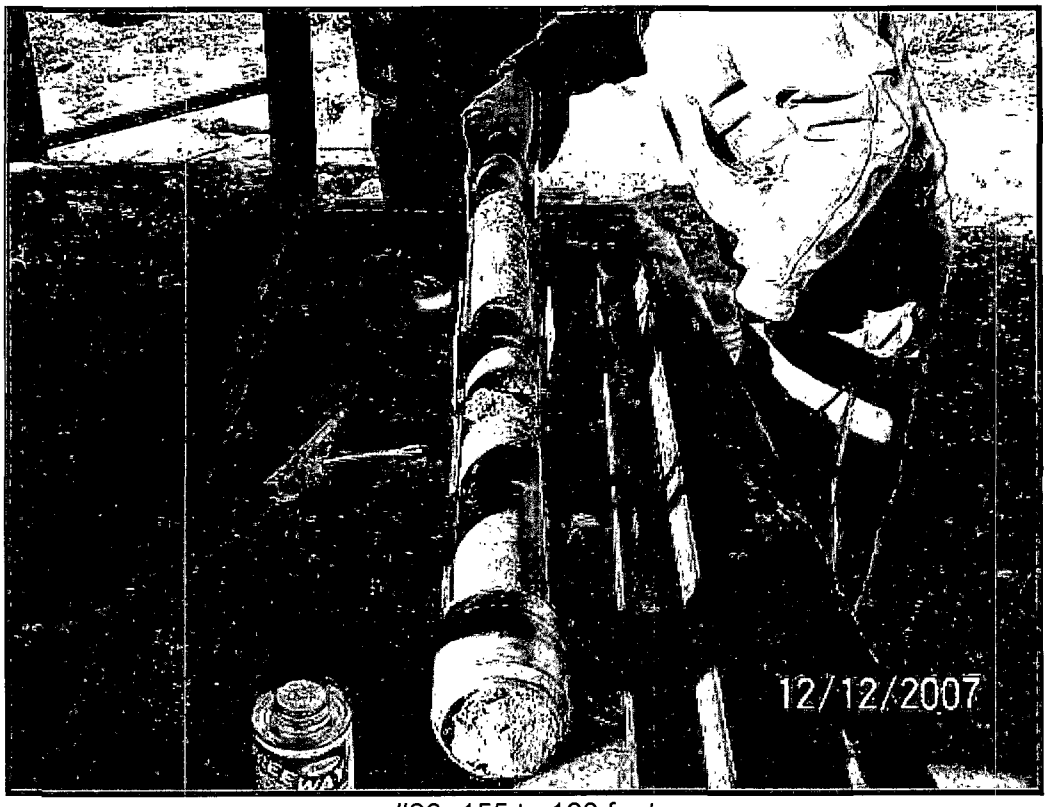


#23- 142 to 145 feet

#24- 145 to 150 feet



#25- 150 to 155 feet



#26- 155 to 160 feet

Safety & Environmental Solutions, Inc.

LOG OF WELL MW-1

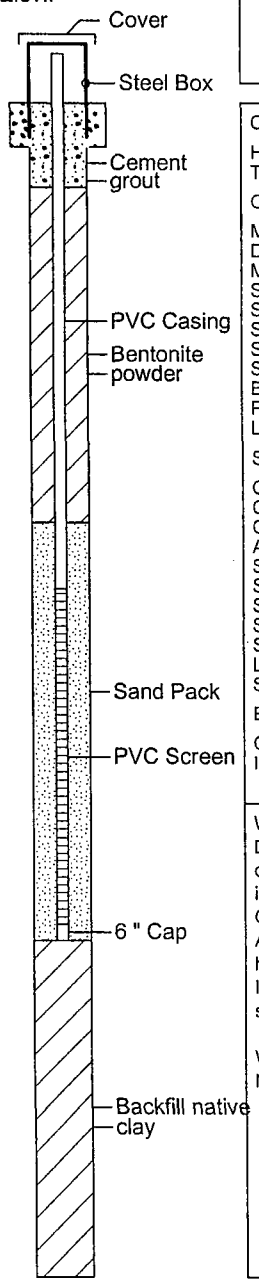
Groundwater Investigation
Artesia Aeration
Maljamar, New Mexico
N1/2, Section 7, T17S, R32E

Date, Time Started:	: 05/14/05; 0900	Drilled By:	: Eco/Enviro Drilling
Date, Time Completed	: 05/14/05; 1430	Logged By:	: D.G. Boyer, SESI
Hole Diameter:	: 8 1/4"	Northing Coordinate	:
Drilling Method:	: Hollow Stem Auger	Easting Coordinate	:
Drilling Equipment:	: Foremost-Mobile B-57	Survey By	:

Sample Type:
SS Split Spoon (18 in. or 24 in.)
CB Core Barrel (5 ft.)
CT Auger Cuttings
NR No recovery

Depth in Feet	Sample Type	Recovery (ft.)	USCS	GRAPHIC	DESCRIPTION
0	CT		SP		0-4 ft. SAND, poorly graded (uniform), light brown, fine grained, dry
5	CT		CA		4-6 ft. CALICHE, white (chalk color), dry
			SP		6-10 ft. SAND, poorly graded (uniform), light brown, fine grained, frequent small caliche gravels/fragments to 1/4", dry
10	CT		ML		9-10 ft. Increasing caliche gravels and silt 10-15 ft. SANDY SILT, very light brown, with occasional caliche gravel, very dry
15	CT		SP		15-20 ft. SILTY SAND, light reddish brown, very fine grained, dry
20	CB	1.9			20-23 ft. SAND, reddish-brown, very fine grained, dry
25	CB		CL		23-25 ft. CLAY, brown, very stiff, dry, very plastic when wetted 25-27 ft. CLAY, brown, very stiff, dry
30	CB	1.8	CL/MS		27-30 ft. CLAY, green, some platey structure (claystone or mudstone), very fine crystals (calcite?), dry 30-33 ft. CLAY, brown and yellow, dry, crumbly 33-34 ft. CLAY and claystone (mudstone), greenish gray, platey, crumbly, dry 34-35 ft. CLAY, grayish grading to brown at base, crumbly, dry
35					

Well: MW-1
Elev.:



Well Construction Information

COMPLETION DATA

Hole Depth	: 35 ft. Below LS
TD Inside casing	: 27.5 ft. Below TOC

CASING, SCREEN & CAP

Material, joints	: PVC, threaded
Diameter	: 2 in. ID
Manufacturer	: LAIBE
Screen type	: Slotted
Screen length	: 10 ft.
Screen opening	: 0.020 slot
Scrn. placement	: 15-25 ft. BLS
Sump	: None
Bottom Cap	: 0.5 ft PVC
Protector Casing	: Steel box
Lock Key #	: - -

SEALS & SAND PACK

Cement seal type	: QuikCrete
Cem't placement	: 0 - ~2.5 ft. BLS
Grout placement	: - -
Annular seal type	: Aquagel bentonite
Seal volume	: 4 bg powder, hydrated
Seal placement	: 2.5-12.5 ft. BLS
Sand pack type	: 8/16 Oglebay silica
Sand volume	: 6 bags
Sand placement	: 12.5-25 ft. BLS
Lower Annular seal	: Native clay (backfill)
Seal placement	: 25-35 BLS

ELEVATIONS

Ground elevation	: Approx. 4035 ft.
Inner casing, top	: - -

WELL INSTALLATION:
Drilled to 35 feet with 8 1/4" auger to determine lithology. Backfilled to 25 ft. and installed well with 10 ft. screen. 6 bags 8/16 Oglebay-Norton sand to 12.5 ft., 4 bags Aquagel bentonite powder to 2.5 ft., hydrated. QuikCrete cement mix to surface. Installed locking steel protection casing, stick-up approximatel 2.5 ft.

WELL DEVELOPMENT:
None - well dry, 5/14/05

Notes:
Monitor well dry upon completion.
Location approximately 15 ft. north of service road between entrance and landfarm Cell 1.

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Safety & Environmental Solutions, Inc.

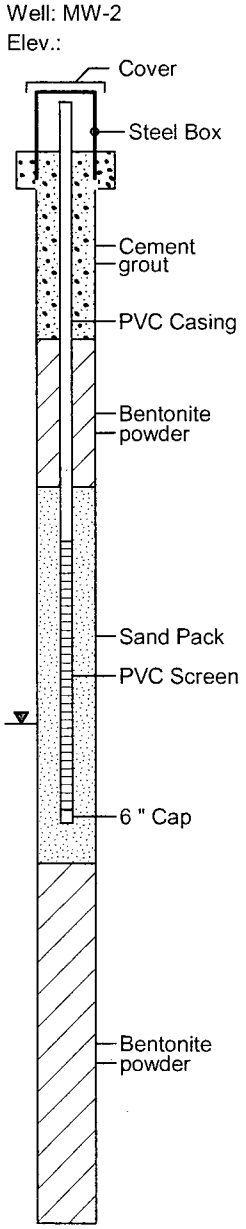
LOG OF WELL MW-2

Groundwater Investigation
Artesia Aeration
Maljamar, New Mexico
N1/2, Section 7, T17S, R32E

Date, Time Started:	: 05/27/05; 1130	Drilled By:	: Eco/Enviro Drilling
Date, Time Completed	: 05/27/05; 1700	Logged By:	: D.G. Boyer, SESI
Hole Diameter:	: 8 1/4"	Northing Coordinate	:
Drilling Method:	: Hollow Stem Auger	Easting Coordinate	:
Drilling Equipment:	: Foremost-Mobile B-57	Survey By	:

Sample Type:
SS Split Spoon (18 in. or 24 in.)
CB Core Barrel (5 ft.)
CT Auger Cuttings
NR No recovery

Depth in Feet	Sample Type	Recovery (ft.)	USCS	GRAPHIC	DESCRIPTION
0					
	CT				0-5 ft. SAND, reddish brown, fine grained, uniform, dry
5	CT		SP		5-10 ft. SAND, brown to reddish brown, very fine to fine grained, slightly damp, caliche fragments to 1/2 in. at base
10	CT				10-12 ft. SAND, brown to reddish brown, very fine to fine grained
	CT		SP/GP		12-14 ft. GRAVELLY SAND, sand brown, fine grained, with granitic gravels to 1.5 in. Large gravels angular, smaller gravels rounded, quartz common in gravels
			SP		
15	CT		SC		14-15 ft. SAND, as above
					15-20 ft. CLAYEY SAND, grading to sandy clay at 20 ft. Possible contact with redbeds.
20	CB	2	CL		20-25 ft. GRAVELLY SILTY CLAY/ GRAVELLY SANDY CLAY, reddish brown, with very hard caliche in tip, gravels are caliche gravels.
25	CB	5	CL		25-28.5 ft. CLAY, reddish brown, very dry (redbed) 28.5-29 ft. CLAY, green-gray-brown striations, very dry
30			CL/CS		29-31 ft. CLAY and CLAYSTONE, clay brown, claystone dark brown, partially consolidated, poorly cemented, very dry
	CB	5	CL		
			MS		31-33.1 ft. CLAY, reddish brown, stiff, very dry, powdery when broken
35			CL/CS		33.1-35 ft. CLAYSTONE, dark brown, poorly consolidated, poorly cemented, dry
	CB	5	CS		35-35.9 ft. CLAY and CLAYSTONE, reddish-brown, very dry
40					36.9-40 ft. CLAYSTONE, dark brown, poorly cemented, occasional green inclusions (pea size), occasional caliche streak, very dry.



Well Construction Information

COMPLETION DATA

Hole Depth	: 40 ft. Below LS
TD Inside casing	: 28.29 ft. Below TOC

CASING, SCREEN & CAP

Material, joints	: PVC, threaded
Diameter	: 2 in. ID
Manufacturer	: LAIBE
Screen type	: Slotted
Screen length	: 10 ft.
Screen opening	: 0.020 slot
Scrn. placement	: 15-25 ft. BLS
Sump	: None
Bottom Cap	: 0.5 ft PVC
Protector Casing	: Above grade steel
Lock Key #	: - -

SEALS & SAND PACK

Cement seal type	: QuikCrete
Cem't placement	: 0 - 7 ft. BLS
Grout placement	: - -
Annular seal type	: Aquagel bentonite
Seal volume	: 3 bg powder, hydrated
Seal placement	: 7-12.5 ft. BLS
Sand pack type	: 8/16 Oglebay silica
Sand volume	: 9 bags
Sand placement	: 12.5-25 ft. BLS
Lower Annular seal	: 5 bg powder, hydrated
Seal placement	: 26.5-40 BLS

ELEVATIONS

Ground elevation	: Approx. 4035 ft.
Inner casing, top	: - -

WELL INSTALLATION:
Drilled to 40 feet with 8 1/4" auger to determine lithology. Backfilled to 25 ft. and installed well with 10 ft. screen. 5 bags bentonite powder to 26.5 ft., 1.5 bags 8/16 Oglebay-Norton sand to 25 ft., 7.5 bags to 12.5 ft, 3 bags Aquagel bentonite powder to 7 ft., hydrated. QuikCrete cement mix to surface. Installed locking steel protection casing, stick-up approximatel 3.2 ft. above land surface. Water at 24.86 BTC.

WELL DEVELOPMENT:
On 05/29/05 measured DTW at 24.49 ft. BTC. Pumped out approximately 2.5 gallons and collected water sample.

On 06/03/05 measured water at 24.56 ft. and pumped 1.5 gallon until dry.

Notes:
Location south side of service road opposite SE corner of landfarm Cell 6.

Safety & Environmental Solutions, Inc.

LOG OF BORING BH-3

Groundwater Investigation
Artesia Aeration
Maljamar, New Mexico
N1/2, Section 7, T17S, R32E

Date, Time Started:	: 06/29/05; 1100	Drilled By:	: Eco/Enviro Drilling
Date, Time Completed	: 06/29/05; - -	Logged By:	: D.G. Boyer, SESI
Hole Diameter:	: 8 1/4"	Northing Coordinate	:
Drilling Method:	: Hollow Stem Auger	Easting Coordinate	:
Drilling Equipment:	: Foremost-Mobile B-57	Survey By	:

Sample Type:
SS Split Spoon (18 in. or 24 in.)
CB Core Barrel (5 ft.)
CT Auger Cuttings
NR No recovery

Depth in Feet	Sample Type	Recovery (ft.)	USCS	GRAPHIC	DESCRIPTION
0	CB	1.4	SP		0-5 ft. SAND, reddish brown, very fine grained, approx. 1 in. caliche and sand at 5 ft., chalk color
5	CB	5	CA		5-5.8 ft. SAND, reddish brown, very fine grained
					5.8-7 ft. CALICHE, chalk-color with brown inclusions, soft
			SP		7-10 ft. SAND with caliche fragments, chalk color, very fine grained, soft caliche, dry
10	CB	3.8	SW		10-10.5 ft. SAND, very light brown, with sandstone "cookies"
					10.5-12 ft. GRAVELLY SAND, sand very light brown, very fine to fine grained, gravels are granitic to 3/4 in.
			SP		12-13.5 ft. SAND, brown, very fine grained, granitic gravels at 13.5 ft.
			SS		13.5-13.7 ft. SANDSTONE, poorly cemented, dry
15	CB	2.7	SS/SL		15-17.3 ft. SANDSTONE/SILTSTONE, poorly consolidated and poorly cemented.
			SP		17.3-17.5 ft. SAND, light brown, very fine grained, dry
20	CB	NR	- -		20-25 ft. No recovery, nothing in core or on tip, dry core barrel
25	CB	3.7	SS/SL		25-26 ft. SANDSTONE/SILTSTONE, light brown, very fine grained, hard.
			CL		26-28.7 ft. Red-bed CLAY, reddish-brown, very stiff, very dry
30					

Notes:
Location 65 ft. south of MW-2 between MW-2 and water pipeline. Backfilled with 10 bags 3/8 in. Holeplug bentonite chips, hydrated.

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Safety & Environmental Solutions, Inc.

LOG OF BORING BH-4

Groundwater Investigation
Artesia Aeration
Maljamar, New Mexico
N1/2, Section 7, T17S, R32E

Date, Time Started:	: 06/29/05; - -	Drilled By:	: Eco/Enviro Drilling
Date, Time Completed	: 06/29/05; 1630	Logged By:	: D.G. Boyer, SESI
Hole Diameter:	: 8 1/4"	Northing Coordinate	:
Drilling Method:	: Hollow Stem Auger	Easting Coordinate	:
Drilling Equipment:	: Foremost-Mobile B-57	Survey By	:

Sample Type:
SS Split Spoon (18 in. or 24 in.)
CB Core Barrel (5 ft.)
CT Auger Cuttings
NR No recovery

Depth in Feet	Sample Type	Recovery (ft.)	USCS	GRAPHIC	DESCRIPTION
0					
	CB	2	AR		0-1.7 Fill material (rock, sand), damp
			SP		1.7-2 ft. SAND, brown, very fine to fine grained, damp
5			SC		5-5.4 ft. CLAYEY SAND, reddish-brown, slightly damp
			CA/CL		5.4-6.6 ft. CALICHE (soft), chalk color and sandy clay, brown
	CB	5	CA		6.6-8.0 ft. CALICHE, sandy (or caliche sand) soft, very light brown,
			SP		8.0-10.0 ft. SAND, limey sand grading to brown sand, very fine grained, dry core
10					10-12.6 ft. SAND, brown, very fine grained
	CB	3.8			12.6-13.8 ft. SAND, limey, chalk white, very fine grained, silty, powdery in spots, Hard chert/sandstone rock at base (15 ft.), dry core
15					15-16.2 ft. SAND, very light brown, very fine grained, limey, dry
	CB	2.2	SP/SS		16.2 ft. SANDSTONE rock at 16.2 ft., hard, well cemented 16.2-17.2 ft. SAND and SANDSTONE, sand limey, very fine grained, sandstone consolidated but poorly cemented, dry
20			SS/SP		20-21.9 ft. SANDSTONE and SAND, sandstone poorly consolidated, medium cementing; sand brown, very fine grained, dry
	CB	4.2	CL		21.9-24.2 ft. Redbed CLAY, brown, very stiff, very dry
25					
	CB	3.2	CL		25-28.2 ft. SANDY CLAY with some clayey sand, redbeds, hard, competent sandstone, rock in tip, dry.
30					

Notes:
Located in southern 1/3 center of Cell 6. Backfilled with 13 bags 3/8 in. Holeplug bentonite chips, hydrated.

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Safety & Environmental Solutions, Inc.

LOG OF BORING MW-3-1

Groundwater Investigation
Artesia Aeration
Maljamar, New Mexico
N1/2, Section 7, T17S, R32E

Date, Time Started:	: 10/30/07; 0930	Drilled By:	: Eco/Enviro Drilling
Date, Time Completed	: 10/30/07; 1600	Logged By:	: D.G. Boyer, P.G., SESI
Hole Diameter:	: 8 1/4"	Northing Coordinate	:
Drilling Method:	: Hollow Stem Auger	Easting Coordinate	:
Drilling Equipment:	: Foremost-Mobile B-57	Survey By	:

Sample Type:
RC Rock Coring Bit
CB Core Barrel (5 ft.)
CT Auger Cuttings
NR No recovery

Depth in Feet	Sample Method	Recovery (ft.)	USCS	GRAPHIC	DESCRIPTION
0	CB	1.2	SP		0-1.0 ft. SAND, reddish-brown, fine grained, blow sand, dry
			GP/SP		1-1.2 ft. CALICHE GRAVEL and limey SAND, gravel to 3/4", white
5	CB	0.5	CA/SP		5-10 ft. Caliche rock in bit; cuttings are very fine to fine grained sand with caliche
10	CB	1.5			10-12.5 ft. CALICHE and SAND, very light brown, very fine grained, with granitic pea-sized pebbles mainly from 11-11.5 ft., dry.
	CB	2.6	SP		12.5-14.5 ft. SAND, light brown, fine grained, occasional caliche gravel to 3/4 - 1 in., sand lightly cemented in places.
			CA		14.5-15 ft. CALICHE, rock in core tip, very light brown, well cemented, dry
15	CB	2.2	GW		15-17.5 ft. SANDY GRAVEL, gravel sizes pea to 2 in., smaller are granitic, larger are caliche, hard limestone with silica; sand light to very light brown, very fine to fine grained, some silt, dry
					17.5-18 ft. SANDY GRAVEL, as above
	CB	2.2	SP		18-19.1 ft. SAND, brown, very fine to fine grained, uniform, occasional caliche rock
			SS		19.1-19.7 ft. SANDSTONE, very light brown, soft, very poorly cemented, dry
20	CB	2.2	SP		20-21.8 ft. SAND, brown, very fine to fine grained, uniform, clean, dry
					21.8-22.2 ft. SAND, limey, very light brown to creme color, very fine grained, dry
					22.2-22.9 ft. SAND, limey, with small gravels
	CB	2.5			22.9-25.0 ft. SAND, light brown, very fine to fine grained, uniform, dry
25					

Notes:
Drillers could not drill deeper than 50 ft. without adding H2O to move cuttings up auger.
Onsite 10/31/07, 0800, measured hole, total depth 44 ft. BLS, dry, no water, plugged top 3 ft. with wooden plug.
Onsite 12/11/07, uncovered plug and measured hole, caved/bridged to 9.5 ft. BLS, dry, plugged back to surface with 12 bags HolePlug bentonite, hydrated.

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Safety & Environmental Solutions, Inc.

LOG OF BORING MW-3-1

Groundwater Investigation
Artesia Aeration
Maljamar, New Mexico
N1/2, Section 7, T17S, R32E

Date, Time Started:	: 10/30/07; 0930	Drilled By:	: Eco/Enviro Drilling
Date, Time Completed	: 10/30/07; 1600	Logged By:	: D.G. Boyer, P.G., SESI
Hole Diameter:	: 8 1/4"	Northing Coordinate	:
Drilling Method:	: Hollow Stem Auger	Easting Coordinate	:
Drilling Equipment:	: Foremost-Mobile B-57	Survey By	:

Sample Type:
RC Rock Coring Bit
CB Core Barrel (5 ft.)
CT Auger Cuttings
NR No recovery

Depth in Feet	Sample Method	Recovery (ft.)	USCS	GRAPHIC	DESCRIPTION
25	CB	2.2	SP		25-27 ft. SAND, light brown, very fine grained, dry, compacted
					27-27.2 ft. SAND, limey, very light brown, dry, compacted with weak cement
	CB	2.3	SP/SS		27.5-30 ft. SAND, very fine grained, and SANDSTONE, limey, very light brown, very fine grained, poorly cemented, very limey from 29.5-29.8 ft.
30	CB	2.3			30-32.5 ft. SAND, light brown, very fine to fine grained, and occasional SANDSTONE, very fine grained, very poorly cemented, dry
	CB	2.6			32.5-35 ft. SAND, light brown, very fine to fine grained, occasional limey SANDSTONE, very poorly cemented, dry
35	CB	2.2			35-37.5 ft. SAND, light brown, very fine to fine grained, occasional SANDSTONE lens < 1/2 ft. thick, poorly cemented, dry
	CB	2.2			37.5-40 ft. SAND, light brown, fine grained, and occasional SANDSTONE lens < 1/2 ft. thick, soft, poorly cemented, dry
40	CB	2.4	SP		40-41.3 ft. SAND, light brown, very fine to fine grained, dry
					41.3-42.4 ft. SAND, reddish-brown, fine grained, dry
	CB	2.6	SS		42.5-43.6 ft. Silty, clayey SANDSTONE, reddish-brown, some very fine grained sand, variable cementing
					43.6-45.1 ft. SANDSTONE, *reddish-brown, very fine to fine grained, at base silty clay and siltstone,* dry
45	CB	2.2	CL/CS		45-47.5 ft. "Redbed", CLAY, CLAYSTONE, MUDSTONE, some sand, brown to reddish-brown, generally consolidated, hard, dry
	CB	2.2	SS/CS		47.5-50 ft. "Redbed", SANDSTONE, CLAYSTONE, reddish-brown, soft, friable but generally consolidated, dry
50					

Notes:
Drillers could not drill deeper than 50 ft. without adding H2O to move cuttings up auger.
Onsite 10/31/07, 0800, measured hole, total depth 44 ft. BLS, dry, no water, plugged top 3 ft. with wooden plug.
Onsite 12/11/07, uncovered plug and measured hole, caved/bridged to 9.5 ft. BLS, dry, plugged back to surface with 12 bags HolePlug bentonite, hydrated.

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Safety & Environmental Solutions, Inc.

LOG OF BORING MW-3-2

Groundwater Investigation
Artesia Aeration
Maljamar, New Mexico
N1/2, Section 7, T17S, R32E

Date, Time Started:	: 12/11/07; 0900	Drilled By:	: Harrison-Cooper, Lubbock
Date, Time Completed	: 12/13/07; 1200	Logged By:	: D.G. Boyer, P.G., SESI
Hole Diameter:	: 9-7/8" pilot, 5-1/2" coring	Northing Coordinate	:
Drilling Method:	: *Diamond coring bit*	*Easting Coordinate*	:
Drilling Equipment:	: Ingersoll-Rand TH-60	Survey By	:

Sample Type:
RC Rock Coring Bit
CB Core Barrel (5 ft.)
CT Auger Cuttings
NR No recovery

Depth in Feet	Sample Method	Recovery (ft.)	USCS	GRAPHIC	DESCRIPTION
50	CT		SP/CA		0-50.7 ft. Drill to 50.8 ft with air, set ____ diameter PVC suface casing to prevent caving of sands. Cuttings are sand, caliche gravels and limestone fragments
	RC	2.0	SL/MS		50.7-52.7 ft. "Redbeds", SILTSTONE, CLAYSTONE, MUDSTONE, CLAY, variable color, light yellowish-brown to reddish-brown, friable, dry
55	RC	3.5	SS/SL		52.7-56.2 ft. SANDSTONE, light brown, very fine grained, friable, well cemented, with some reddish-brown, SILTSTONE
	RC	1.9	SS		56.2-56.7 ft. SANDSTONE, very light brown, silty, well cemented, condensation moisture
			SL		56.7-58.1 ft. SANDY SILTSTONE, light brown to reddish-brown, dry
60	RC	5.0			58.7-63.7 ft. SANDSTONE, light brown, well cemented, with thin siltstone/mudstone lenses at 60.5 and 61.1 ft.
65	RC	5.0	SS		63.7-68.7 ft. SANDSTONE, light brown, very fine grained, hard, well cemented
70	RC	5.0			68.7-73.7 ft. SANDSTONE, very light brown, very fine grained, hard, well cemented
75	RC	5.0			73.7-76.2 ft. SANDSTONE, very light brown, very fine grained, hard, well cemented, dry
			CS		76.2-76.3 ft. CLAYSTONE
			SS		76.3-78.7 ft. SANDSTONE
80					

Notes:
Harrison-Cooper drillers moved 30 ft. NNE of original location, drilled to 50.7 ft. and set 6-in. ID PVC surface casing with top of casing 1.0 ft above land surface. Coring hole is 5-1/2 in., retrieved core diameter 3 in.
See MW-3 well completion log for monitor well installation details

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Safety & Environmental Solutions, Inc.

LOG OF BORING MW-3-2

Groundwater Investigation
Artesia Aeration
Maljamar, New Mexico
N1/2, Section 7, T17S, R32E

Date, Time Started:	: 12/11/07; 0900	Drilled By:	: Harrison-Cooper, Lubbock
Date, Time Completed	: 12/13/07; 1200	Logged By:	: D.G. Boyer, P.G., SESI
Hole Diameter:	: 9-7/8" *pilot*, 5-1/2" *coring*	*Northing Coordinate*	:
Drilling Method:	: Diamond coring bit	Easting Coordinate	:
Drilling Equipment:	: Ingersoll-Rand TH-60	Survey By	:

Sample Type:
RC Rock Coring Bit
CB Core Barrel (5 ft.)
CT Auger Cuttings
NR No recovery

Depth in Feet	Sample Method	Recovery (ft.)	USCS	GRAPHIC	DESCRIPTION
80	RC	5.0	SS		78.7-83.7 ft. SANDSTONE, very light brown, very fine grained, very hard, very well cemented, dry
85	RC	4.6			83.7-88.3 ft. SANDSTONE, very light brown, very fine grained, very hard, very well cemented, dry
90	RC	4.6			88.3-92.9 ft. SANDSTONE, very light brown, very fine grained, very hard, very well cemented, dry
95	RC	4.6			92.9-97.5 ft. SANDSTONE, very light brown, very fine grained, very hard, very well cemented, dry
100	RC	3.6			97.5-101.1 ft. SANDSTONE, very light brown, very fine grained, very hard, very well cemented, dry
	RC	4.3			101.1-102.2 ft. SANDSTONE, very light brown, very fine grained, very hard, very well cemented, dry 102.2-105.4 ft. SANDSTONE, with embedded brown-black clay/claystone inclusion, hard, dry
105	RC	4.0	SS/CS		105.2-108.9 ft. SANDSTONE, very light brown, very fine grained, very hard, very well cemented, dry, with increasing clay lenses at base. Clay thin, hard, well cemented
110			SS/CS		108.9-109.1 ft. SANDSTONE, yellowish-brown, soft 109.1-109.3 ft. SANDSTONE, with brown CLAY inclusions, well cemented

Notes:
Harrison-Cooper drillers moved 30 ft. NNE of original location, drilled to 50.7 ft. and set 6-in. ID PVC surface casing with top of casing 1.0 ft above land surface. Coring hole is 5-1/2 in., retrieved core diameter 3 in.
See MW-3 well completion log for monitor well installation details

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Safety & Environmental Solutions, Inc.

LOG OF BORING MW-3-2

Groundwater Investigation
Artesia Aeration
Maljamar, New Mexico
N1/2, Section 7, T17S, R32E

Date, Time Started:	: 12/11/07; 0900	Drilled By:	: Harrison-Cooper, Lubbock
Date, Time Completed	: 12/13/07; 1200	Logged By:	: D.G. Boyer, P.G., SESI
Hole Diameter:	: 9-7/8" pilot, 5-1/2" coring	Northing Coordinate	:
Drilling Method:	: Diamond coring bit	Easting Coordinate	:
Drilling Equipment:	: Ingersoll-Rand TH-60	Survey By	:

Sample Type:
RC Rock Coring Bit
CB Core Barrel (5 ft.)
CT Auger Cuttings
NR No recovery

Depth in Feet	Sample Method	Recovery (ft.)	USCS	GRAPHIC	DESCRIPTION
110	RC	4.1	SS/CS		109.3-109.5 ft. SANDSTONE and MUDSTONE, fractured but hard and dry 109.5-110.9 ft. SANDSTONE, with brown CLAY, inclusions, hard, dry 110.9-112.7 ft. SANDSTONE, light brown, very hard 112.7-113.0 ft. CLAY, hard, cemented (in core tip)
115	RC	4.0	SS SS/CL LS SS/CL		113.0-115.1ft. SANDSTONE, light brown, very hard 115.1-115.4 ft. SANDSTONE, with CLAY inclusions 115.4-116.7 ft. LIMESTONE, light gray, with some microcrystals, very hard (wet-likely condensation or water from cleaning core tubes)
120	RC	4.0	SS LS SS SS/CL		116.7-117.0 ft. SANDSTONE and CLAY 117.0-118.0 ft. SANDSTONE, yellowish-brown 118.0-118.1 ft. LIMESTONE, gray 118.1-119.5 ft. SANDSTONE
125	RC	4.4	LS CS LS LS/SS		119.5-121.0 ft. SANDSTONE, CLAY 121-121.5 ft. LIMESTONE, light gray, very hard 121.5-122.3 ft. CLAYSTONE, light brown, mottled, fractures 122.3-123.9 ft. LIMESTONE, light gray, oolitic, fossil inclusions 123.9-125.4 ft. LIMESTONE grading to SANDSTONE, SANDSTONE very light brown, very hard, core dry
130	RC	4.9	SS MS CL/CS		125.4-125.9 ft. SANDSTONE 125.9-126.7 ft. MUDSTONE, gray, sandstone fragments 126.7-128.9 ft. "Redbeds", CLAY and CLAYSTONE, very hard, cemented, core dry but moist on outer surface only (condensation/wash water, driller cleaning barrel with water, not completly dry going in hole) 129 ft. Fracture zone, moist 129-130.3 ft. CLAY, "redbeds", moisture on core surface
135	RC	4.3	CL/CS		130.3-132.4 ft. CLAY, "redbeds", moisture on core surface 132.4-134.6 ft. CLAYSTONE/MUDSTONE "redbeds", hard, dry
140			CL/CS		137.7-141.7 ft. CLAY and CLAYSTONE, "redbeds", some fractured rock, dry

Notes:
Harrison-Cooper drillers moved 30 ft. NNE of original location, drilled to 50.7 ft. and set 6-in. ID PVC surface casing with top of casing 1.0 ft above land surface. Coring hole is 5-1/2 in., retrieved core diameter 3 in.
See MW-3 well completion log for monitor well installation details

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Safety & Environmental Solutions, Inc.

LOG OF BORING MW-3-2

Groundwater Investigation
Artesia Aeration
Maljamar, New Mexico
N1/2, Section 7, T17S, R32E

Date, Time Started:	: 12/11/07; 0900	Drilled By:	: Harrison-Cooper, Lubbock
Date, Time Completed	: 12/13/07; 1200	Logged By:	: D.G. Boyer, P.G., SESI
Hole Diameter:	: 9-7/8" pilot, 5-1/2" coring	Northing Coordinate	:
Drilling Method:	: Diamond coring bit	Easting Coordinate	:
Drilling Equipment:	: Ingersoll-Rand TH-60	Survey By	:

Sample Type:
RC Rock Coring Bit
CB Core Barrel (5 ft.)
CT Auger Cuttings
NR No recovery

Depth in Feet	Sample Method	Recovery (ft.)	USCS	GRAPHIC	DESCRIPTION
140	RC	4.0	CL/CS		141.7-143.3 ft. CLAY and CLAYSTONE, "redbeds", brown
	RC	3.6	CS		143.3-145.3 ft. CLAYSTONE, mottled then gray, hard, dry
145	RC	4.6	CL/CS		145.3-146.8 ft. CLAY and CLAYSTONE "redbed", fractured 146.8-147.1 ft. CLAY and CLAYSTONE "redbed"
			CL		147.1-147.5 ft. CLAY, gray
			CL/CS		147.5-149.9 ft. CLAY and CLAYSTONE "redbed"
150	RC	4.7			149.9-151.2 ft. CLAY and CLAYSTONE "redbed" 151.2-152.4 ft. CLAY and CLAYSTONE "redbed"
					152.4-154.6 ft. CLAY and CLAYSTONE "redbed", dry, fractures at 153.4 ft.
155	RC	5.0			154.6-159.6 CLAY and CLAYSTONE "redbed", reddish-brown, fractured in places, dry
160					
165					
170					

Notes:
Harrison-Cooper drillers moved 30 ft. NNE of original location, drilled to 50.7 ft. and set 6-in. ID PVC surface casing with top of casing 1.0 ft above land surface. Coring hole is 5-1/2 in., retrieved core diameter 3 in.
See MW-3 well completion log for monitor well installation details

Safety & Environmental Solutions, Inc.

LOG OF BORING MW-3-3

Groundwater Investigation
Artesia Aeration
Maljamar, New Mexico
N1/2, Section 7, T17S, R32E

Date, Time Started:	: 12/11/07; 0930	Drilled By:	: Eco/Enviro Drilling
Date, Time Completed	: 12/11/07; 1130	Logged By:	: D.G. Boyer, P.G., SESI
Hole Diameter:	: 8 1/4"	Northing Coordinate	:
Drilling Method:	: Hollow Stem Auger	Easting Coordinate	:
Drilling Equipment:	: Foremost-Mobile B-57	Survey By	:

Sample Type:
RC Rock Coring Bit
CB Core Barrel (5 ft.)
CT Auger Cuttings
NR No recovery

Depth in Feet	Sample Method	Recovery (ft.)	USCS	GRAPHIC	DESCRIPTION
0	CB	1.4	AR		0-1.4 ft. FILL MATERIAL used to construct well pad, caliche with sand, some clay
	CB	2.0	SP		2.5-5 ft. SAND, reddish-brown, very fine grained, some roots, slightly damp
5	CB	2.2			5-6.5 ft. SAND, reddish-brown, very fine grained, slightly damp
	CB	1.6	CA		6.5-7.2 ft. CALICHE, very light brown (creme color), fragments soft to hard 7.5-9.1 ft. CALICHE, light brown (creme color), soft to hard, some fragments to 1.5 in., becoming sandy at 9.1 ft.
10	CB	2.4	CA/SW		10-12.5 ft. CALICHE, sandy, becoming GRAVELLY SAND, sand creme-colored becoming light brown. Caliche and limestone gravels to 1.5 in., very hard
	CB	2.0	SW		12.5-15 ft. GRAVELLY SAND, light brown, caliche/limestone gravels, some small granitic gravels to 1/4 in.
15					
20					
25					

Notes:
Plugged back to surface with 7 bags HolePlug bentonite, hydrated.

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Safety & Environmental Solutions, Inc.

LOG OF BORING MW-3 (Composite)

Groundwater Investigation
Artesia Aeration
Maljamar, New Mexico
N1/2, Section 7, T17S, R32E

Date, Time Started:	: 10/30/07; 0900	Drilled By:	: Harrison-Cooper, Lubbock
Date, Time Completed	: 12/13/07; 1200	Logged By:	: D.G. Boyer, P.G., SESI
Hole Diameter:	: 9-7/8" pilot, 5-1/2" coring	Northing Coordinate	:
Drilling Method:	: Diamond coring bit	Easting Coordinate	:
Drilling Equipment:	: Ingersoll-Rand TH-60	Survey By	:

Sample Type:
RC Rock Coring Bit
CB Core Barrel (5 ft.)
CT Auger Cuttings
NR No recovery

Depth in Feet	Sample Method	Recovery (ft.)	USCS	GRAPHIC	DESCRIPTION
0	CB	1.4	AR		Detailed log copied from borehole MW-3-3. 0-1.4 ft. FILL MATERIAL used to construct well pad, caliche with sand, some clay
	CB	2.0	SP		2.5-5 ft. SAND, reddish-brown, very fine grained, some roots, slightly damp
5	CB	2.2			5-6.5 ft. SAND, reddish-brown, very fine grained, slightly damp
	CB	1.6	CA		6.5-7.2 ft. CALICHE, very light brown (creme color), fragments soft to hard 7.5-9.1 ft. CALICHE, light brown (creme color), soft to hard, some fragments to 1.5 in., becoming sandy at 9.1 ft.
10	CB	2.4	CA/SW		10-12.5 ft. CALICHE, sandy, becoming GRAVELLY SAND, sand creme-colored becoming light brown. Caliche and limestone gravels to 1.5 in., very hard
	CB	2.0	SW		12.5-15 ft. GRAVELLY SAND, light brown, caliche/limestone gravels, some small granitic gravels to 1/4 in.
15	CB	2.2	GW		Detailed log copied from borehole MW-3-1. 15-17.5 ft. SANDY GRAVEL, gravel sizes pea to 2 in., smaller are granitic, larger are caliche, hard limestone with silica; sand light to very light brown, very fine to fine grained, some silt, dry 17.5-18 ft. SANDY GRAVEL, as above
	CB	2.2	SP		18-19.1 ft. SAND, brown, very fine to fine grained, uniform, occasional caliche rock
			SS		19.1-19.7 ft. SANDSTONE, very light brown, soft, very poorly cemented, dry
20	CB	2.2	SP		20-21.8 ft. SAND, brown, very fine to fine grained, uniform, clean, dry 21.8-22.2 ft. SAND, limey, very light brown to creme color, very fine grained, dry 22.2-22.9 ft. SAND, limey, with small gravels
	CB	2.5			22.9-25.0 ft. SAND, light brown, very fine to fine grained, uniform, dry
25					

Notes:
Eco/Enviro Drilling drilled to 50 ft.; could not drill deeper consolidated formation.
Harrison-Cooper drillers moved 30 ft. NNE of original location, drilled to 50.7 ft. and set 6-in. ID PVC surface casing with top of casing 1.0 ft above land surface. Coring hole is 5-1/2 in., retrieved core diameter 3 in.
See MW-3 well completion log for monitor well installation details

Safety & Environmental Solutions, Inc.

LOG OF BORING MW-3 (Composite)

Groundwater Investigation
Artesia Aeration
Maljamar, New Mexico
N1/2, Section 7, T17S, R32E

Date, Time Started:	: 10/30/07; 0900	Drilled By:	: Harrison-Cooper, Lubbock
Date, Time Completed	: 12/13/07; 1200	Logged By:	: D.G. Boyer, P.G., SESI
Hole Diameter:	: 9-7/8" pilot, 5-1/2" coring	Northing Coordinate	:
Drilling Method:	: Diamond coring bit	Easting Coordinate	:
Drilling Equipment:	: *Ingersoll-Rand TH-60*	Survey By	:

Sample Type:
RC Rock Coring Bit
CB Core Barrel (5 ft.)
CT Auger Cuttings
NR No recovery

Depth in Feet	Sample Method	Recovery (ft.)	USCS	GRAPHIC	DESCRIPTION
25	CB	2.2	SP		25-27 ft. SAND, light brown, very fine grained, dry, compacted 27-27.2 ft. SAND, limey, very light brown, dry, compacted with weak cement
	CB	2.3	SP/SS		27.5-30 ft. SAND, very fine grained, and SANDSTONE, limey, very light brown, very fine grained, poorly cemented, very limey from 29.5-29.8 ft.
30	CB	2.3			30-32.5 ft. SAND, light brown, very fine to fine grained, and occasional SANDSTONE, very fine grained, very poorly cemented, dry
	CB	2.6			32.5-35 ft. SAND, light brown, very fine to fine grained, occasional limey SANDSTONE, very poorly cemented, dry
35	CB	2.2			35-37.5 ft. SAND, light brown, very fine to fine grained, occasional SANDSTONE lens < 1/2 ft. thick, poorly cemented, dry
	CB	2.2			37.5-40 ft. SAND, light brown, fine grained, and occasional SANDSTONE lens < 1/2 ft. thick, soft, poorly cemented, dry
40	CB	2.4	SP		40-41.3 ft. SAND, light brown, very fine to fine grained, dry 41.3-42.4 ft. SAND, reddish-brown, fine grained, dry
	CB	2.6	SS		42.5-43.6 ft. Silty, clayey SANDSTONE, reddish-brown, some very fine grained sand, variable cementing 43.6-45.1 ft. SANDSTONE, reddish-brown, very fine to fine grained, at base silty clay and siltstone, dry
45	CB	2.2	CL/CS		45-47.5 ft. "Redbed", CLAY, CLAYSTONE, MUDSTONE, some sand, brown to reddish-brown, generally consolidated, hard, dry
	CB	2.2	SS/CS		47.5-50 ft. "Redbed", SANDSTONE, CLAYSTONE, reddish-brown, soft, friable but generally consolidated, dry
50					

Notes:
Eco/Enviro Drilling drilled to 50 ft.; could not drill deeper consolidated formation.
Harrison-Cooper drillers moved 30 ft. NNE of original location, drilled to 50.7 ft. and set 6-in. ID PVC surface casing with top of casing 1.0 ft above land surface. Coring hole is 5-1/2 in., retrieved core diameter 3 in.
See MW-3 well completion log for monitor well installation details

Safety & Environmental Solutions, Inc.

LOG OF BORING MW-3 (Composite)

Groundwater Investigation
Artesia Aeration
Maljamar, New Mexico
N1/2, Section 7, T17S, R32E

Date, Time Started:	: 10/30/07; 0900	Drilled By:	: Harrison-Cooper, Lubbock
Date, Time Completed	: 12/13/07; 1200	Logged By:	: D.G. Boyer, P.G., SESI
Hole Diameter:	: 9-7/8" pilot, 5-1/2" coring	Northing Coordinate	:
Drilling Method:	: Diamond coring bit	Easting Coordinate	:
Drilling Equipment:	: Ingersoll-Rand TH-60	Survey By	:

Sample Type:
RC Rock Coring Bit
CB Core Barrel (5 ft.)
CT Auger Cuttings
NR No recovery

Depth in Feet	Sample Method	Recovery (ft.)	USCS	GRAPHIC	DESCRIPTION
50	CT		SP/CA		Detailed log copied from borehole MW-3-2. 50-50.7 ft. Drill to 50.8 ft with air, set 6-in. ID PVC suface casing to prevent caving of sands. Cuttings are sand, caliche gravels and limestone fragments
	RC	2.0	SL/MS		50.7-52.7 ft. "Redbeds", SILTSTONE, CLAYSTONE, MUDSTONE, CLAY, variable color, light yellowish-brown to reddish-brown, friable, dry
	RC	3.5	SS/SL		52.7-56.2 ft. SANDSTONE, *light brown, very fine grained, friable, well cemented, with some* reddish-brown, SILTSTONE
55			SS		56.2-56.7 ft. SANDSTONE, very light brown, silty, well cemented, condensation moisture
	RC	1.9	SL		56.7-58.1 ft. SANDY SILTSTONE, light brown to reddish-brown, dry
	RC	5.0			58.7-63.7 ft. SANDSTONE, *light brown, well cemented, with thin siltstone/mudstone lenses at 60.5* and 61.1 ft.
60					
	RC	5.0	SS		63.7-68.7 ft. SANDSTONE, *light brown, very fine grained, hard, well cemented*
65					
	RC	5.0			68.7-73.7 ft. SANDSTONE, very light brown, very fine grained, hard, well cemented
70					
					73.7-76.2 ft. SANDSTONE, very light brown, very fine grained, hard, well cemented, dry
75					

Notes:
Eco/Enviro Drilling drilled to 50 ft.; could not drill deeper consolidated formation.
Harrison-Cooper drillers moved 30 ft. NNE of original location, drilled to 50.7 ft. and set 6-in. ID PVC surface casing with top of casing 1.0 ft above land surface. Coring hole is 5-1/2 in., retrieved core diameter 3 in.
See MW-3 well completion log for monitor well installation details

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Safety & Environmental Solutions, Inc.

LOG OF BORING MW-3 (Composite)

Groundwater Investigation
Artesia Aeration
Maljamar, New Mexico
N1/2, Section 7, T17S, R32E

Date, Time Started:	: 10/30/07; 0900	Drilled By:	: Harrison-Cooper, Lubbock
Date, Time Completed	: 12/13/07; 1200	Logged By:	: D.G. Boyer, P.G., SESI
Hole Diameter:	: 9-7/8" pilot, 5-1/2" coring	Northing Coordinate	:
Drilling Method:	: Diamond coring bit	Easting Coordinate	:
Drilling Equipment:	: Ingersoll-Rand TH-60	Survey By	:

Sample Type:
RC Rock Coring Bit
CB Core Barrel (5 ft.)
CT Auger Cuttings
NR No recovery

Depth in Feet	Sample Method	Recovery (ft.)	USCS	GRAPHIC	DESCRIPTION
75	RC	5.0	SS CS		76.2-76.3 ft. CLAYSTONE 76.3-78.7 ft. SANDSTONE
80	RC	5.0			78.7-83.7 ft. SANDSTONE, very light brown, very fine grained, very hard, very well cemented, dry
85	RC	4.6			83.7-88.3 ft. SANDSTONE, very light brown, very fine grained, very hard, very well cemented, dry
90	RC	4.6	SS		88.3-92.9 ft. SANDSTONE, very light brown, very fine grained, very hard, very well cemented, dry
95	RC	4.6			92.9-97.5 ft. SANDSTONE, very light brown, very fine grained, very hard, very well cemented, dry
100					97.5-101.1 ft. SANDSTONE, very light brown, very fine grained, very hard, very well cemented, dry

Notes:
Eco/Enviro Drilling drilled to 50 ft.; could not drill deeper consolidated formation.
Harrison-Cooper drillers moved 30 ft. NNE of original location, drilled to 50.7 ft. and set 6-in. ID PVC surface casing with top of casing 1.0 ft above land surface. Coring hole is 5-1/2 in., retrieved core diameter 3 in.
See MW-3 well completion log for monitor well installation details

Safety & Environmental Solutions, Inc.

LOG OF BORING MW-3 (Composite)

Groundwater Investigation
Artesia Aeration
Maljamar, New Mexico
N1/2, Section 7, T17S, R32E

Date, Time Started:	: 10/30/07; 0900	Drilled By:	: Harrison-Cooper, Lubbock
Date, Time Completed	: 12/13/07; 1200	Logged By:	: D.G. Boyer, P.G., SESI
Hole Diameter:	: 9-7/8" pilot, 5-1/2" coring	Northing Coordinate	:
Drilling Method:	: Diamond coring bit	Easting Coordinate	:
Drilling Equipment:	: Ingersoll-Rand TH-60	Survey By	:

Sample Type:
RC Rock Coring Bit
CB Core Barrel (5 ft.)
CT Auger Cuttings
NR No recovery

Depth in Feet	Sample Method	Recovery (ft.)	USCS	GRAPHIC	DESCRIPTION
100	RC	3.6	SS		101.1-102.2 ft. SANDSTONE, very light brown, very fine grained, very hard, very well cemented, dry
	RC	4.3	SS/CS		102.2-105.4 ft. SANDSTONE, with embedded brown-black clay/claystone inclusion, hard, dry
105	RC	4.0			105.2-108.9 ft. SANDSTONE, very light brown, very fine grained, very hard, very well cemented, dry, with increasing clay lenses at base. Clay thin, hard, well cemented
	RC	4.1	SS/CS		108.9-109.1 ft. SANDSTONE, yellowish-brown, soft 109.1-109.3 ft. SANDSTONE, with brown CLAY inclusions, well cemented 109.3-109.5 ft. SANDSTONE and MUDSTONE, fractured but hard and dry 109.5-110.9 ft. SANDSTONE, with brown CLAY, inclusions, hard, dry 110.9-112.7 ft. SANDSTONE, light brown, very hard 112.7-113.0 ft. CLAY, hard, cemented (in core tip)
110			SS		113.0-115.1ft. SANDSTONE, light brown, very hard
115	RC	4.0	SS/CL		115.1-115.4 ft. SANDSTONE, with CLAY inclusions
			LS		115.4-116.7 ft. LIMESTONE, light gray, with some microcrystals, very hard (wet-likely condensation or water from cleaning core tubes)
			SS/CL		116.7-117.0 ft. SANDSTONE and CLAY
			SS		117.0-118.0 ft. SANDSTONE, yellowish-brown
	RC	4.0	LS		118.0-118.1 ft. LIMESTONE, gray
			SS		118.1-119.5 ft. SANDSTONE
120			SS/CL		119.5-121.0 ft. SANDSTONE, CLAY
			LS		121-121.5 ft. LIMESTONE, light gray, very hard
			CS		121.5-122.3 ft. CLAYSTONE, light brown, mottled, fractures
			LS		122.3-123.9 ft. LIMESTONE, light gray, oolitic, fossil inclusions
125			LS/SS		123.9-125.4 ft. LIMESTONE grading to SANDSTONE, SANDSTONE very light brown, very hard, core dry

Notes:
Eco/Enviro Drilling drilled to 50 ft.; could not drill deeper consolidated formation.
Harrison-Cooper drillers moved 30 ft. NNE of original location, drilled to 50.7 ft. and set 6-in. ID PVC surface casing with top of casing 1.0 ft above land surface. Coring hole is 5-1/2 in., retrieved core diameter 3 in.
See MW-3 well completion log for monitor well installation details

Safety & Environmental Solutions, Inc.

LOG OF BORING MW-3 (Composite)

Groundwater Investigation
Artesia Aeration
Maljamar, New Mexico
N1/2, Section 7, T17S, R32E

Date, Time Started:	: 10/30/07; 0900	Drilled By:	: Harrison-Cooper, Lubbock
Date, Time Completed	: 12/13/07; 1200	Logged By:	: D.G. Boyer, P.G., SESI
Hole Diameter:	: 9-7/8" pilot, 5-1/2" coring	Northing Coordinate	:
Drilling Method:	: Diamond coring bit	Easting Coordinate	:
Drilling Equipment:	: Ingersoll-Rand TH-60	Survey By	:

Sample Type:
RC Rock Coring Bit
CB Core Barrel (5 ft.)
CT Auger Cuttings
NR No recovery

Depth in Feet	Sample Method	Recovery (ft.)	USCS	GRAPHIC	DESCRIPTION
125	RC	4.4	LS/SS		
			SS		125.4-125.9 ft. SANDSTONE
			MS		125.9-126.7 ft. MUDSTONE, gray, sandstone fragments
	RC	4.9			126.7-128.9 ft. "Redbeds", CLAY and CLAYSTONE, very hard, cemented, core dry but moist on outer surface only (condensation/wash water, driller cleaning barrel with water, not completly dry going in hole)
					129 ft. Fracture zone, moist
130					129-130.3 ft. CLAY, "redbeds", moisture on core surface
	RC	4.3			130.3-132.4 ft. CLAY, "redbeds", moisture on core surface
					132.4-134.6 ft. CLAYSTONE/MUDSTONE "redbeds", hard, dry
135			CL/CS		
	RC	4.0			137.7-141.7 ft. CLAY and CLAYSTONE, "redbeds", some fractured rock, dry
140					
	RC	3.6			141.7-143.3 ft. CLAY and CLAYSTONE, "redbeds", brown
			CS		143.3-145.3 ft. CLAYSTONE, mottled then gray, hard, dry
145			CL/CS		145.3-146.8 ft. CLAY and CLAYSTONE "redbed", fractured
					146.8-147.1 ft. CLAY and CLAYSTONE "redbed"
	RC	4.6	CL		147.1-147.5 ft. CLAY, gray
			CL/CS		147.5-149.9 ft. CLAY and CLAYSTONE "redbed"
150					

Notes:
Eco/Enviro Drilling drilled to 50 ft.; could not drill deeper consolidated formation.
Harrison-Cooper drillers moved 30 ft. NNE of original location, drilled to 50.7 ft. and set 6-in. ID PVC surface casing with top of casing 1.0 ft above land surface. Coring hole is 5-1/2 in., retrieved core diameter 3 in.
See MW-3 well completion log for monitor well installation details

Safety & Environmental Solutions, Inc.

LOG OF BORING MW-3 (Composite)

Groundwater Investigation
Artesia Aeration
Maljamar, New Mexico
N1/2, Section 7, T17S, R32E

Date, Time Started:	: 10/30/07; 0900	Drilled By:	: Harrison-Cooper, Lubbock
Date, Time Completed	: 12/13/07; 1200	Logged By:	: D.G. Boyer, P.G., SESI
Hole Diameter:	: 9-7/8" pilot, 5-1/2" coring	Northing Coordinate	:
Drilling Method:	: Diamond coring bit	Easting Coordinate	:
Drilling Equipment:	: Ingersoll-Rand TH-60	Survey By	:

Sample Type:
RC Rock Coring Bit
CB Core Barrel (5 ft.)
CT Auger Cuttings
NR No recovery

Depth in Feet	Sample Method	Recovery (ft.)	USCS	GRAPHIC	DESCRIPTION
150	RC	4.7	CL/CS		149.9-151.2 ft. CLAY and CLAYSTONE "redbed" 151.2-152.4 ft. CLAY and CLAYSTONE "redbed" 152.4-154.6 ft. CLAY and CLAYSTONE "redbed", dry, fractures at 153.4 ft.
155	RC	5.0			154.6-159.6 CLAY and CLAYSTONE "redbed", reddish-brown, fractured in places, dry
160					
165					
170					
175					

Notes:
Eco/Enviro Drilling drilled to 50 ft.; could not drill deeper consolidated formation.
Harrison-Cooper drillers moved 30 ft. NNE of original location, drilled to 50.7 ft. and set 6-in. ID PVC surface casing with top of casing 1.0 ft above land surface. Coring hole is 5-1/2 in., retrieved core diameter 3 in.
See MW-3 well completion log for monitor well installation details

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ARTESIA AERATION

APPLICATION FOR SURFACE WASTE PERMIT

For State Use Only:

1301 W. Grand Avenue, Artesia, NM 88210
District III
1000 Rio Brazos Road, Aztec, NM 87410
District IV
1220 S. St. Francis Dr., Santa Fe, NM 87505

State of New Mexico
Energy Minerals and Natural Resources

Oil Conservation Division
1220 South St. Francis Dr.
Santa Fe, NM 87505

Form C-137
Revised March 1, 2007

Submit 1 Copy to Santa Fe Office

APPLICATION FOR SURFACE WASTE MANAGEMENT FACILITY

A meeting should be scheduled with the Division's Santa Fe office Environmental Bureau prior to pursuing an application for a surface waste management facility in order to determine if the proposed location is capable of satisfying the siting requirements of Subsections A and B of 19.15.36.13 NMAC for consideration of an application submittal.

1 Application: x New ☐ Modification ☐ Renewal

2. Type: ☐ Evaporation ☐ Injection ☐ Treating Plant ☐ Landfill ☐ Landfarm ☐ Other

3. Facility Status: ☐ Commercial ☐ Centralized

4. Operator: Artesia Aeration

Address: P.O. Box 310 Hobbs, New Mexico 88241

Contact Person: Lary Parker Phone: 575-390-6402

5. Location: /4 /4 Section 5, 6, 7 Township 17S Range 32E

6. Is this an existing facility? ☐ Yes XX No If yes, provide permit number

7. Attach the names and addresses of the applicant and principal officers and owners of 25 percent or more of the applicant. Specify the office held by each officer and identify the individual(s) primary responsible for overseeing management of the facility.

8. Attach a plat and topographic map showing the surface waste management facility's location in relation to governmental surveys (quarter-quarter section, township and range); highways or roads giving access to the surface waste management facility site; watercourses; fresh water sources, including wells and springs; and inhabited buildings within one mile of the site's perimeter.

9. Attach the names and addresses of the surface owners of the real property on which the surface waste management facility is sited and surface owners of the real property within one mile of the site's perimeter.

10. Attach a description of the surface waste management facility with a diagram indicating the location of fences and cattle guards, and detailed construction/installation diagrams of pits, liners, dikes, piping, sprayers, tanks, roads, fences, gates, berms, pipelines crossing the surface waste management facility, buildings and chemical storage areas.

11. Attach engineering designs, certified by a registered professional engineer, including technical data on the design elements of each applicable treatment, remediation and disposal method and detailed designs of surface impoundments.

12. Attach a plan for management of approved oil field wastes that complies with the applicable requirements contained in 19.15.36.13, 19.15.36.14, 19.15.36.15 and 19.15.36.17 NMAC.

13. Attach an inspection and maintenance plan that complies with the requirements contained in Subsection L of 19.15.36.13 NMAC.

14. Attach a hydrogen sulfide prevention and contingency plan that complies with those provisions of 19.15.3.118 NMAC that apply to surface waste management facilities.

15. Attach a closure and post closure plan, including a responsible third party contractor's cost estimate, sufficient to close the surface waste management facility in a manner that will protect fresh water, public health, safety and the environment (the closure and post closure plan shall comply with the requirements contained in Subsection D of 19.15.36.18 NMAC).

16 Attach a contingency plan that complies with the requirements of Subsection N of 19.15.36.13 NMAC and with NMSA 1978, Sections 12-12-1 through 12-12-30, as amended (the Emergency Management Act).

17. Attach a plan to control run-on water onto the site and run-off water from the site that complies with the requirements of Subsection M of 19.15.36.13 NMAC.

18. In the case of an application to permit a new or expanded landfill, attach a leachate management plan that describes the anticipated amount of leachate that will be generated and the leachate's handling, storage, treatment and disposal, including final post closure options.

19. In the case of an application to permit a new or expanded landfill, attach a gas safety management plan that complies with the requirements of Subsection O of 19.15.36.13 NMAC

20. Attach a best management practice plan to ensure protection of fresh water, public health, safety and the environment.

21. Attach a demonstration of compliance with the siting requirements of Subsections A and B of 19.15.36.13 NMAC.

22. Attach geological/hydrological data including:

(a) a map showing names and location of streams, springs or other watercourses, and water wells within one mile of the site;

(b) laboratory analyses, performed by an independent commercial laboratory, for major cations and anions; benzene, toluene, ethyl benzene and xylenes (BTEX); RCRA metals; and total dissolved solids (TDS) of ground water samples of the shallowest fresh water aquifer beneath the proposed site;

(c) depth to, formation name, type and thickness of the shallowest fresh water aquifer;

(d) soil types beneath the proposed surface waste management facility, including a lithologic description of soil and rock members from ground surface down to the top of the shallowest fresh water aquifer;

(e) geologic cross-sections;

(f) potentiometric maps for the shallowest fresh water aquifer; and

(g) porosity, permeability, conductivity, compaction ratios and swelling characteristics for the sediments on which the contaminated soils will be placed.

23. In the case of an existing surface waste management facility applying for a minor modification, describe the proposed change and identify information that has changed from the last C-137 filing.

24. The division may require additional information to demonstrate that the surface waste management facility's operation will not adversely impact fresh water, public health, safety or the environment and that the surface waste management facility will comply with division rules and orders

25. CERTIFICATION

I hereby certify that the information submitted with this application is true, accurate and complete to the best of my knowledge and belief.

Name:Lary Parker

Title: Operational Manager

Signature: _____

Date: 01/04/08

E-mail Address: _laryp1128@yahoo.com

Application for Solid Waste Landfill Submitted by Artesia Aeration

The following is a listing of the owners of Artesia Aeration located 1.2 miles west of Maljamar, New Mexico. They also are equal owners of the real property on which Artesia Aeration is located.

Jim Wilson
8115 N. Grimes
Hobbs, New Mexico 88240
505-392-4742

Rob Matthews
P.O. Box 181
Madisonville Texas
936-348-1255

Jack Matthews
26 E. Compress Road
Artesia New Mexico
575-748-2854

Glen Hedgecock
Carlsbad New Mexico 88220
575-234-9098

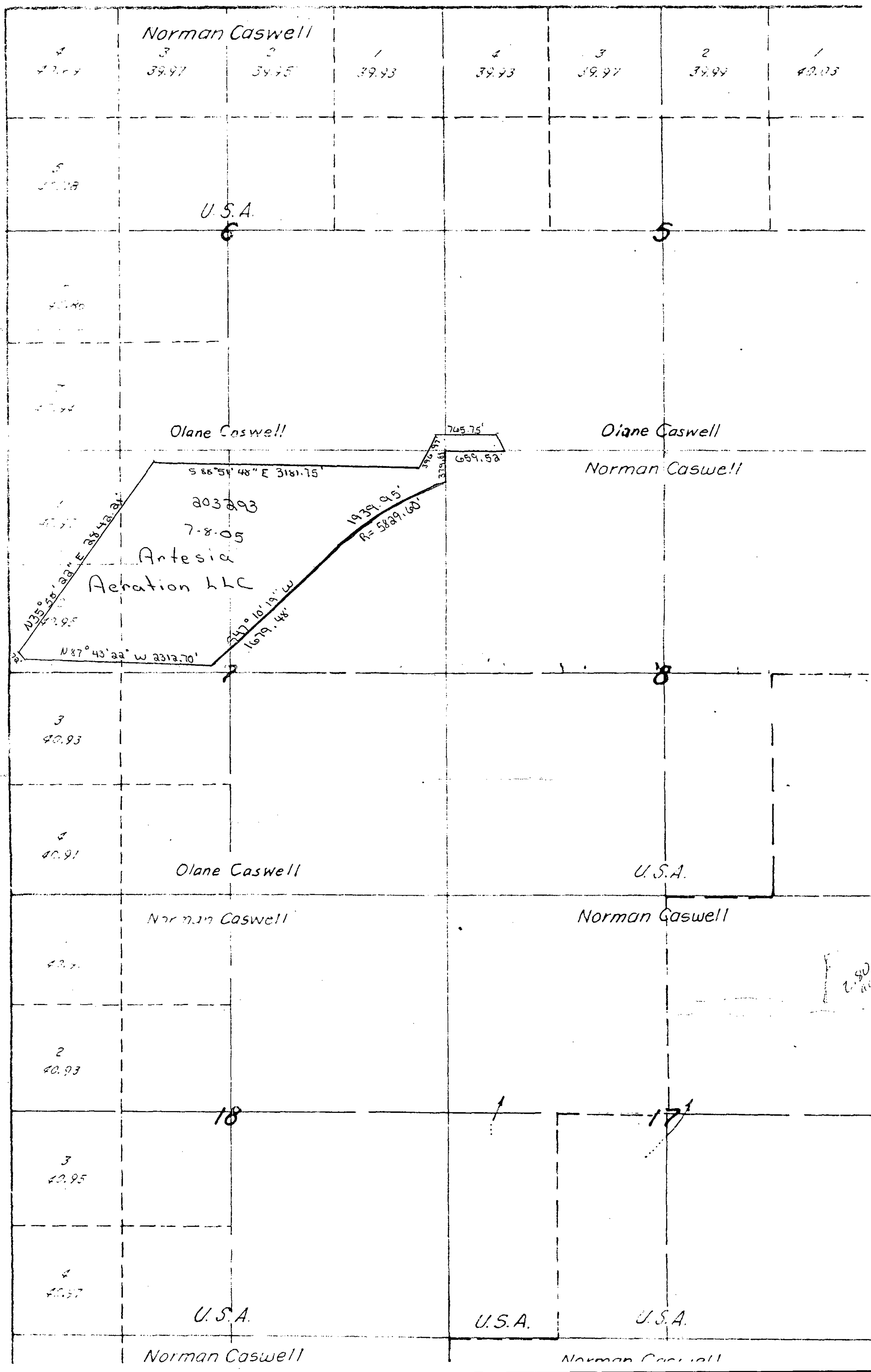
Operating Manager
Lary Parker
1718 W. Millen
Hobbs, New Mexico 88242
505-390-6402

Landowners of record within one (1) mile radius of Artesia Aeration are:

Olane and Ladoyce Caswell
Caswell Ranch
Maljamar, New Mexico 88264
806-637-7004

U.S, Department of Interior
Bureau of Land Management
Carlsbad Field Office
Attention: Bobbie Young
P.O. Box 1778
Carlsbad, New Mexico 88220-6292

State of New Mexico
State Highway and Transportation Department
District II Headquarters
4505 West Second Street
P.O. Box 1457
Roswell, New Mexico 88201-1457



Norman Caswell
3 39.97
2
1 39.93
4 39.93
3 39.97
2
U.S.A.
6
5
Olane Caswell
Olane Caswell
Norman Caswell
745.75'
659.52'
S 86°54' 48" E 3181.75'
203293
7-8-05
Artesia Aeration LLC
1939.95'
R= 5829.60'
S47°10'19" W
1679.48'
N87°43'22" W 2312.70'
7
8
3 40.93
4
Olane Caswell
U.S.A.
Norman Caswell
Norman Caswell
2 40.93
18
17
3 40.95
4
U.S.A.
U.S.A.
U.S.A.
Norman Caswell

DESCRIPTION OF ARTESIA AERATION

Artesia Aeration is proposing to install a surface waste landfill disposal facility at a location that is one point two (1.4) miles west of Maljamar, New Mexico. It is adjacent to Artesia Aeration Landfarm which will be phased out upon awarding the waste permit for the landfill. Private landownership surrounding Artesia Aeration for one mile is the Caswell Ranch. Mr. Caswell is well aware of our endeavors to open a landfill and strongly supports our efforts.

Artesia Aeration is located on sections 5, 6, 7, of township 17S and range 32E in Lea County New Mexico. It consists of 167.856 acres of pasture land with no waterways, lakes, or streams located within guidelines set forth in 19.15.36.13 NMAC. The site is ideally located to help relieve the burden put upon the two existing landfill facilities currently permitted in Lea County and give greater options to operators in the surrounding operating area. In addition, the site meets and exceeds all siting requirements set forth in 19.15.36.13 NMAC.

The location and coordinates of the facility is 032deg 51' 14.23" N 103deg 48' 26.25"W. A map of the site located at back of application. Also attached is supporting maps, research, and plans to make the application acceptable to the commission.

We are located in an area that is easily accessible for producers and with the cell configuration and design will not be obtrusive to passing traffic or to the municipality of Maljamar, New Mexico. The site is ideally suited for our proposal and will help accomplish the desired results of the New Mexico Oil Conservation Division environmental containment program.

References

Ash, S.R. 1963. Ground-water conditions in northern Lea County, New Mexico: U.S. Geological Survey, Hydraulic Investigations Atlas.

Water well records on file with the Office of the New Mexico State Engineer and the U.S. Geological Survey.

Lea County Courthouse Public Record Department

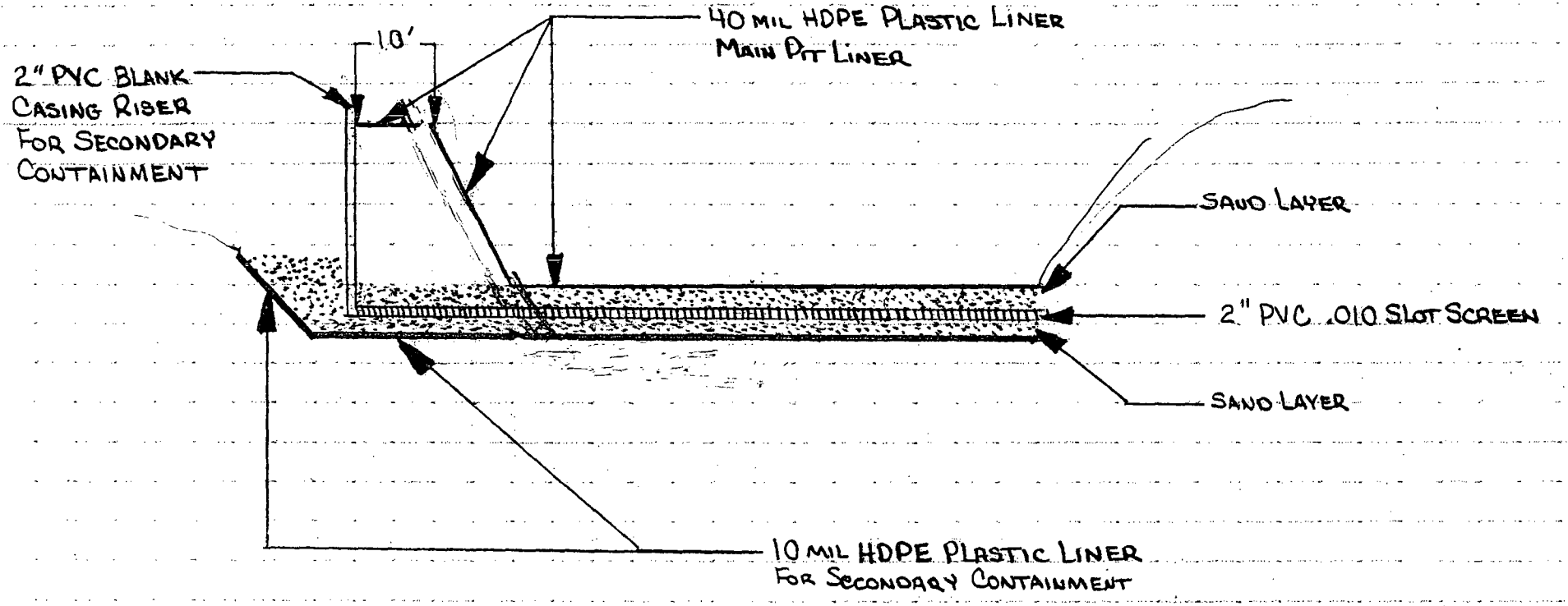
PIT DESIGN

Artesia Aeration proposes the following pit design to comply with division specifications.

We plan to excavate our pit to twenty-two (22) feet in depth with one hundred and twenty-(120) foot by one hundred and fifty (150) dimensions. We will incorporate a three to one slopes on the north, east, and west sides and a one to six slope on the south side. The south side will allow access to bottom of pit for installation of leak detection and leachate systems at base of cell and any stabilization of liner needed prior to acceptance of waste materials.

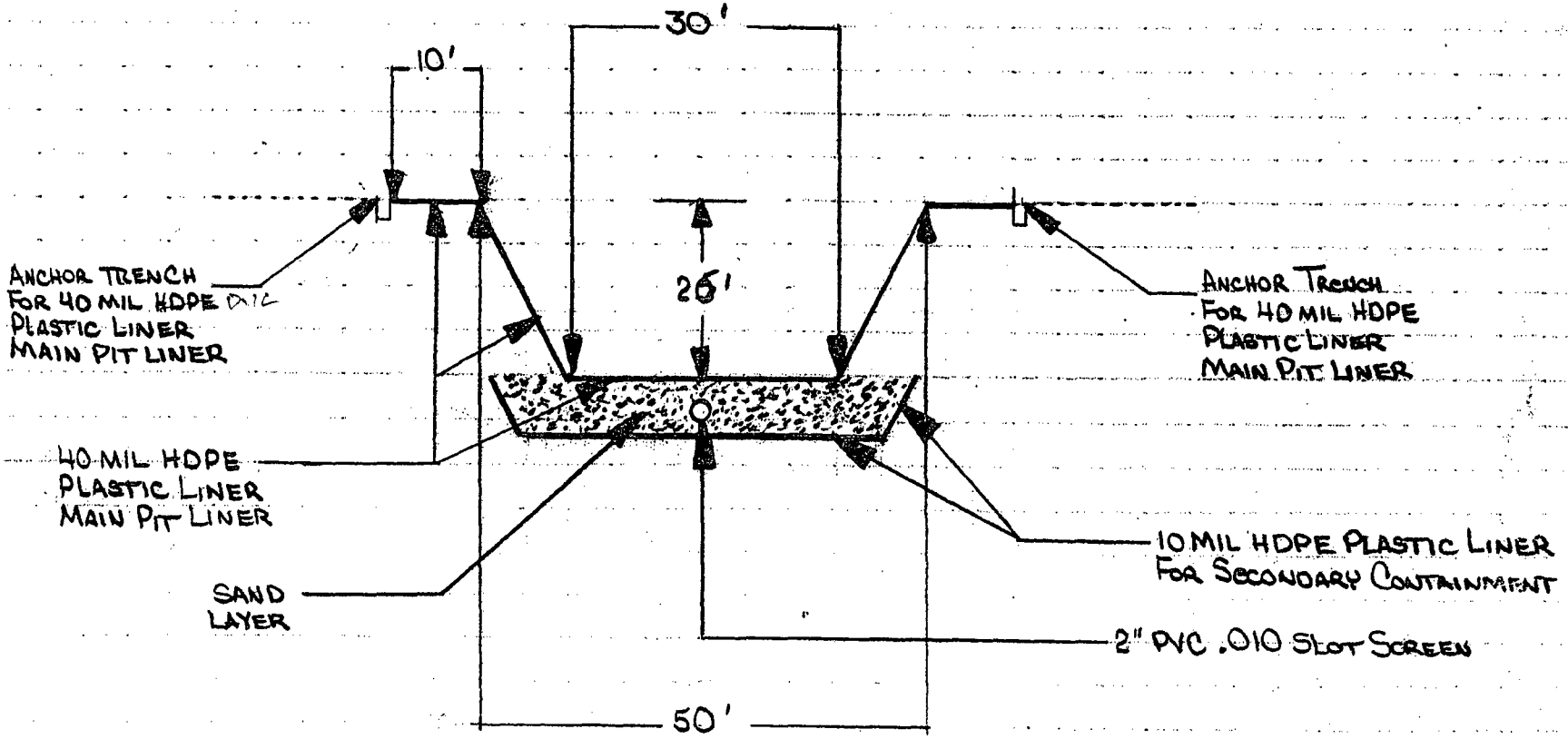
The base of cell will consist of two-(2) foot of clay material that will be compacted to ninety (90) percent standard proctor density. All materials will be graded so as to have no stones or debris that could cause compromise to the geomembranes we will be utilizing. The liner we propose to use for lower geomembrane is a 30 mil PVC. We will use a compacted sand base of six (6) inches on which we will install our leak detection system. This leak detection system will consist of a four-(4) inch schedule 80 PVC .010 slotted screen. Eighteen (18) inches of compacted sand will be laid on top of leak system to allow for migration of any fluid leakage. There will be four-(4) inch PVC risers located at each end of slotted screens. These will extend above grade for leak detection and for removing any fluid that may leachate into system as well as for future sampling.

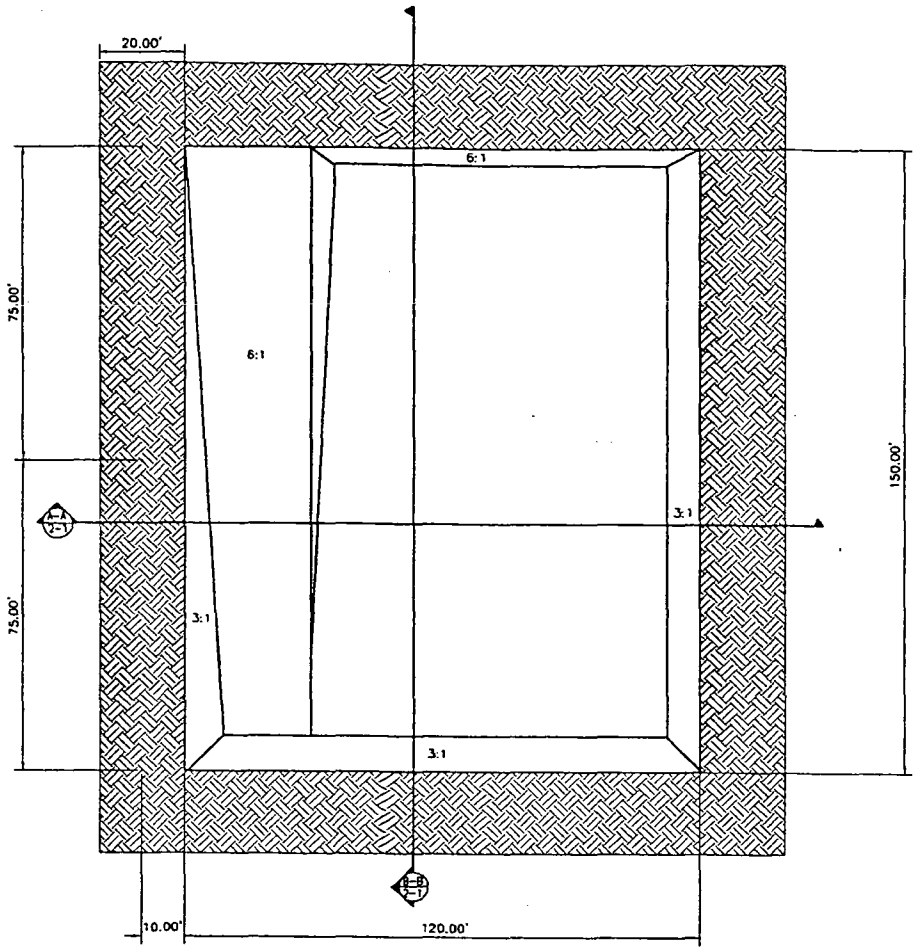
A 30 mil PVC liner will be installed on top of leak system and be the primary lining system. Akome is the contractor we have selected to install our liner. They have multiple years' experience in pit linings and they have the practical knowledge to install the liner as per specifications. The liner will be laid and seamed together with a twenty-(20) foot liner lip around all sides of disposal cell. All seams will be thermally sealed as per standards set forth by division. The attached illustrations show our proposed pit design and the leak and leachate system we anticipate installing.


10'
40 MIL HDPE PLASTIC LINER
MAIN PIT LINER
2" PVC BLANK
CASING RISER
FOR SECONDARY
CONTAINMENT
SAND LAYER
2" PVC .010 SLOT SCREEN
SAND LAYER
10 MIL HDPE PLASTIC LINER
FOR SECONDARY CONTAINMENT

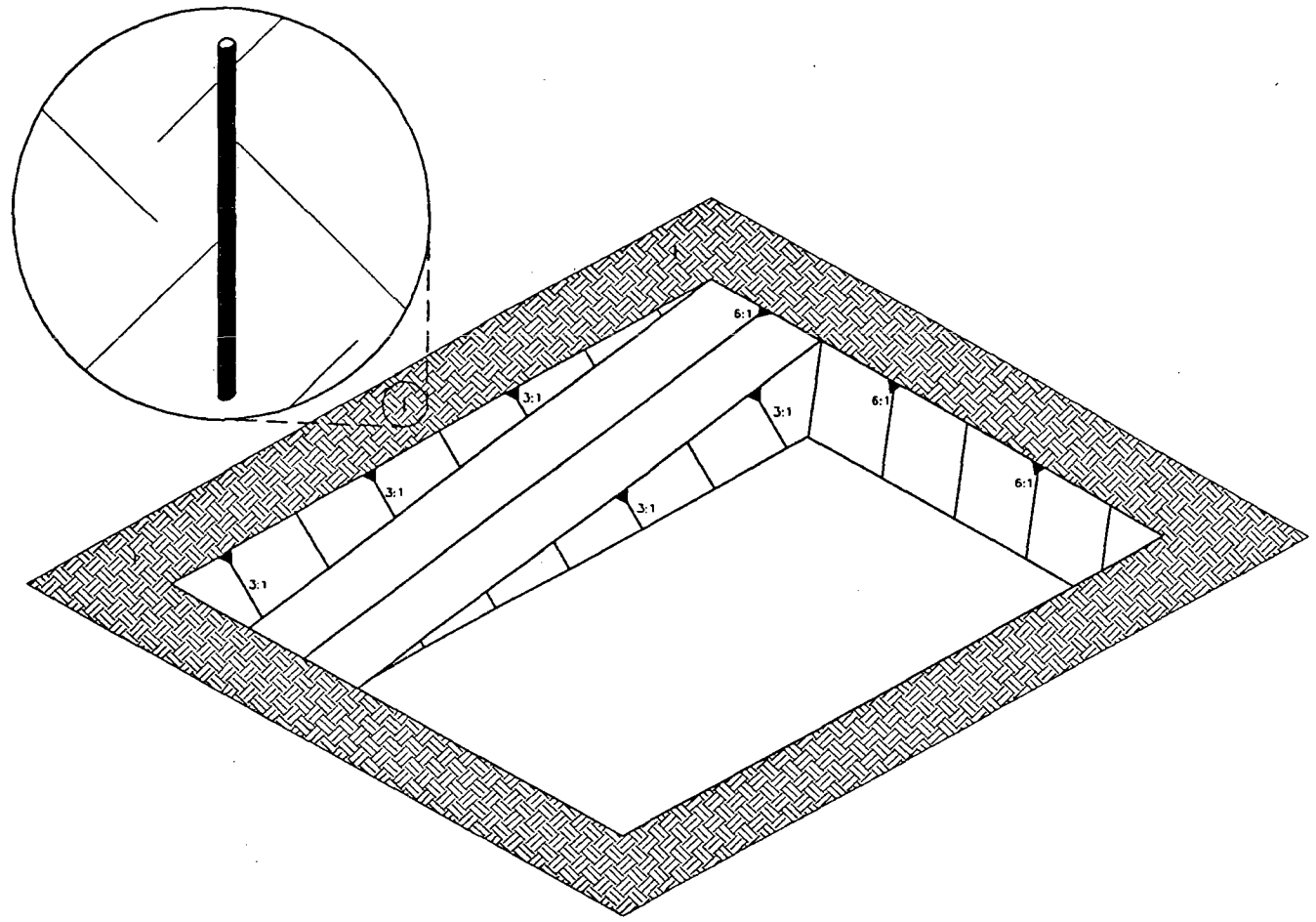
SCALE 1/2" = 10'

SCALE 1/2" = 10'

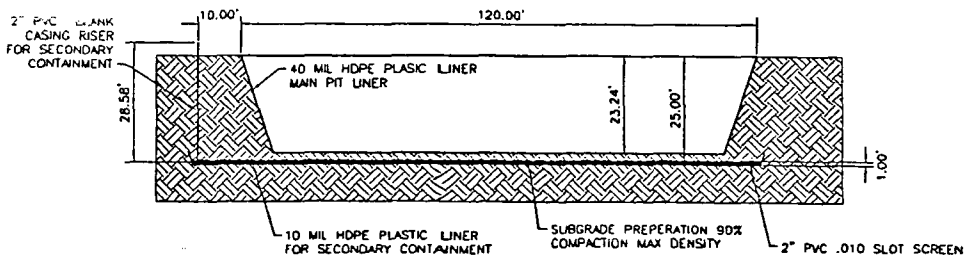

30'
10'
26'
ANCHOR TRENCH FOR 40 MIL HDPE PLASTIC LINER MAIN PIT LINER
ANCHOR TRENCH FOR 40 MIL HDPE PLASTIC LINER MAIN PIT LINER
40 MIL HDPE PLASTIC LINER MAIN PIT LINER
10 MIL HDPE PLASTIC LINER FOR SECONDARY CONTAINMENT
SAND LAYER
2" PVC .010 SLOT SCREEN
50'



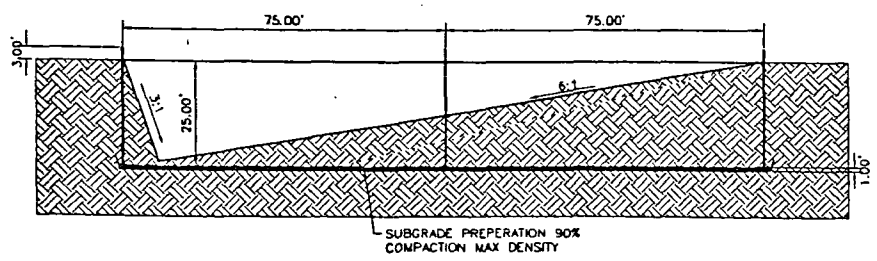
1 / 2-1 PLAN VIEW
SCALE: 1:20



2 / 2-1 ISOMETRIC VIEW
SCALE: 1:20



3 / 2-1 A-A FRONT ELEVATION
SCALE: 1:20



4 / 2-1 B-B RIGHT ELEVATION
SCALE: 1:20

NOTES:
1. IF THIS DRAWING IS OTHER THAN FULL SIZE, (22" X 34"), UTILIZE BAR SCALE IN LIEU OF NUMERIC SCALE.
2. ALL UTILITY MANHOLES, METERS, CLEANOUTS AND VALVES IMPACTED BY CONSTRUCTION TO BE FIELD LOCATED AND ADJUSTED TO GRADE. THIS SHALL BE INCIDENTAL TO THE PROJECT.

PROGRESS FILE

EDDY COUNTY, NEW MEXICO
CITY OF ARTESIA

5	4	3

ARTESIA AERATION DRAWING

Smith Engineering Company
A Full Service Engineering Company
Roswell, NM • Albuquerque, NM • Las Cruces, NM

JOB NO: 807629
DATE: JANUARY 20
SHEET: 2-1

Management Plan for Artesia Aeration

PART 1) Depth to ground water at Artesia Aeration is in excess of 100 feet as displayed by monitor wells drilled at location in accordance with 19.15.36.13 NMAC. No ground water is located 50 foot below the lowest level of disposal area in compliance with 19.15.36.13 section a. 5. Artesia Aeration meets all criteria set forth in 19.15.36.13 section B and is in compliant in all areas.

PART 2) Artesia Aeration waste management will be less than the 500 acres set forth in the siting requirements.

PART 3) Artesia Aeration has no plans or seeks no permits to accept waste fluids at the proposed landfill facility. Our primary function will be to accept solid oilfield wastes for disposal at the landfill only.

PART 4) Artesia Aeration will accept only non-hazardous oilfield waste that is verified by certification of a signed form C-138 from the generator or authorized agent. All exempt waste will be from approved process from oil and gas operations and explorations. These waste streams will not be co-mingled with non-exempt wastes. We will accept certifications on a per load basis with the exceptions of continual approved waste stream processes or projects. This certification will be on a monthly basis. This documentation will be inspected by an attendant at the time of entrance into facility. All documentation and certifications will be kept at facility for division inspection.

PART 5) Artesia Aeration will not accept waste that contains naturally occurring radioactive material (NORM). A radiation survey will be conducted with the copy of the survey being kept on site. This will be monitored and administrated by the agent of Artesia Aeration that will be on duty. All documentation of monitoring and inspection will be on hand at facility. Material having readings of more than 30 picocuries above background will be denied disposal access.

PART 6) All solid waste accepted at Artesia Aeration must pass the paint filter test pursuant to EPA method 9095 A.

PART 7) Artesia Aeration will accept non-exempt solid wastes with an approved C-138 and all required testing documentation. The testing required will be as follows:
TPH (hydrocarbon analysis)
TCLIP (hazardous constituent analysis)
Ignitability Test
Corrosivity
Reactivity Test
Paint Filter Test
All material must be below limits set forth. Testing must be at approved and recognized test facility with copy of test results accompanying C-138 and kept at facility for division inspection.

PART 8) Artesia Aeration will accept non-hazardous, non-oilfield waste only is so directed by the department of public safety. We will complete C-138 describing waste and reason for acceptance and submit to OCD for inspection.

PART 9) Operational procedures for Artesia Aeration will be as follows:

A 6ft X 6ft sign will be on display at entrance to facility stating facility name, permit number, legal location, and emergency phone numbers. This sign will be visible for 100 foot.

An employee will be on duty during all operational hours stationed at entrance to facility. The gates will be locked when an attendant is not on duty and the facility is closed. Normal operating hours will be from 7:00am mst to 5:30pm mst Monday through Friday. Facility may remain open for extended time during projects and based on facility personnel. No entrance will be allowed when attendant is not on duty. Entire facility will be fenced and all gates will be locked.

All documentation and recordkeeping will be maintained at disposal facility. Copies of all incoming manifests, C-138's, and other documentation will be filed and available for division inspection. All manifests will include generators name, site or location from which waste was generated, date of disposal, description of material, and volume of material. The will also include the transporter, name of the driver, and the person accepting the material as well as the time of day. A sample of receiving manifest will be submitted for approval by the division upon permitting.

PART 10) Artesia Aeration will conduct monthly inspection of all leak detection monitoring stations on all disposal cells active and closed. This inspection will include volume of leak detected, a report of analytical data, a detail report of date, location of detection, and corrective measures proposed. This inspection will be made available to the division and be kept on file at facility. The report will include the status of the leak detection system and the name of the inspector. The inspection will be made within the first five days of each month.

An inspection will be made twice yearly of all monitoring wells associated with the facility. Water, if encountered, will be analyzed and all reports of sampling will be supplied to OCD division. Any maintenance records, status reports, and inspectors name will also be supplied in accordance with guidelines.

Inspection of berms around active cells will be a daily activity with quarterly inspections being furnished to the division. Repairs made because of erosion, wind, or storm conditions will be corrected and noted with these records being kept at facility for inspection.

Artesia Aeration will maintain berms with a minimum height of three (3) foot around disposal cells to protect commingling of fluid run off with solid waste in cell. This will also prevent overflow of cell with excessive rain and moisture and contain fluids for removal to authorized fluid disposal facility. A buildup of fluids will be removed via vacuum trucks as accumulations warrant. No fluids will be stored on facility. There are no waterway, rivers, lakes, ponds, or playas within five (5) miles surrounding proposed facility.

MAINTENANCE PROCEDURES

A daily inspection will be done on entire facility. The inspection will be done by the supervisor on duty prior to opening of the facility daily. The inspection will begin with housekeeping duties performed at the proposed office and surrounding area. All trash will be disposed of and cleanliness will be demanded.

A complete inspection of all roadways will be done prior to opening the facility for disposal. Obstacles will be cleared and trash and debris removed and placed in dumpster. Leakage from trucks and vehicles, if any, on roadways will be cleared and disposed of in cell. A visual inspection of road condition will be made at that time also. If repair is needed, it will be made prior to opening facility.

Inspections will be made on disposal cell including berms, surrounding backing areas, and the pit itself. Repairs to berms will be made immediately to ensure runoff control is intact. The area where trucks and vehicles back to pit will be kept smooth and well indicated to avoid backing or pullout accidents and mishaps. The pit area will be visually inspected for any apparent problems. The surface covering of the liner will be adequately covered by soil to ensure no tearing or ripping of the liner on the surface area. An inspection of the surrounding fence will be done and any problems noted and handled promptly the same day to ensure security and prevention of unapproved access or accidental entry to facility by personnel or animals. All deficiencies or problems will be noted by the inspector and filed in office for reference and or inspection by the OCD. All write ups will be handled immediately or as soon as equipment or personnel become available. Inspections will done on all facility equipment such as loaders, dozers, and excavators to ensure trouble free operations and prevent breakdowns. Downed equipment could cause serious backup problems at the disposal. Inspection and maintenance records of all equipment will be kept at office.

Cleanliness, safety, and environmental protection will be our uppermost priority and will not be taken lightly. All inspection records will be reviewed by operations manager daily and follow up inspections will be performed.

H2S Contingency Plan for Artesia Aeration

Artesia Aeration is appying for a solid waste permit and if approved we anticipate a very low exposure rate to hydrogen sulfide. The facility will be manned during all operating hours and admittance will be monitored and recorded. During closed hours gates will be closed and locked with admittance allowed only with company personnel present. Any load checked in at gate or office that has a H2s reading of more than 10ppm will be throughly checked and if reading register more than 50ppm entry will be denied and no alloance to dispose of at Artesia Aeration. To maintain a safety level for the pubic and for our emplyoees we will implement the following plans:

All emplyoees will receive training and certification for working in H2S environments. This training will be conducted by a certified training instuctor and company. Certification will be renewed annually and all employees will retain their certificates on their persons at all times.

All emplyoees working in the facility will wear personal H2S monitors while in the facility. Employees will be educated in the proper use and maintence of monitors. Monitors will be inspected and serviced by a certified person or company in accordance with manufactors requirements. In additon to personal monitors a multi-gas monitor will be on site to ensure safe working conditions. The multi-gas monitor will be located in the office area and be available to facility supervisor to monitor any readings over 10ppm. A Scott air pack will be located within facility office in the event of an emergency to be used to evacuate a fallen employee or visitor on site.

Windsocks will be installed strategically on site to inform employees, contractors, and customers on site of the prevailing wind directions in case of any excessive H2s releases. The socks will be placed as follows: One sock will be placed at the enterance to the facility and readily visable as one drives in to the facility. One will be placed southwest edge of the facility 50 feet from nearest disposal cell. One will be placed on northern edge of disposal cell area. These windsocks will be of adaquate size and color to be readily visable

from disposal area and will comply with regulations concerning previous. An audio warning devise will be installed to notify persons on site in the event of a discharge of over 100ppm H2S. Instructions will be posted in office proper manuvers in the event of an emergency.

The following emergancy phone numbers will be posted for notification in the event of a H2S release of over 100ppm.

Lovington Fire Department - Emergency 911- Non emergency- 505-396-2359
Maljamar Fire Department- Emergency 911- Non emergency- 505-676-4100
Loco Hills Fire Department- Emergency 911- Non emergency- 505-746-5000
New Mexico State Police Emergency 911- Non emergency- 505-392-5588(in accordance with N.M. HMER)
Lea County OCD Non emergency- 505-393-6161

An assemly area will be established directly outside of eastern gate for all employees to gather in the event of an H2S release. This area will be designated by a sign and on the emergency information sheet in office. The plant manager will be in charge of personnel acountability in the event of an evacuation. Drills will be conducted on a quarterly basis with documentation of drill and results will be kept on site for one year.

In the event of a release of over 100ppm H2S the following procedures will be followed:

The alarm will be sounded by supervisor or first available employee.
All personnel are to assemble in designated area.
Supervisor will ensure all personnel are accounted for and assembled.
Emergency phone numbers will be called by supervisor or available employee.
Gates will be closed and locked.
Entry will not be allowed except for trained responders.
Supervisor and employees will co-operate with responders and assist

as directed.
All clear will sound when emergency has been eradicated and responders have given all clear.
Gates will be reopened only at that time.
Detailed report will be given to OCD within 24 hours.

At all times Artesia Aeration will abide and adhere to the "Recommend Practices for Oil and Gas Producing and Gas Processing Plant Operations Involving Hydrogen Sulfide" RP-55. It is our goal to make Artesia Aeration a safe atmosphere in which to work with the knowledge that we are doing our part to ensure safety.

CLOSURE PLAN FOR ARTESIA AERATION

Artesia Aeration plans on having only one open, active disposal cell in operation at any given time. Consequentially, our closure plan would be of a smaller scale. Attached are quotes that would facilitate the closure.

We are only going to be a solid waste disposal site and no fluids will be stored or disposed of at our facility. As stated we plan on having only one active cell in operation at any time with filled cells completely closed pursuant to 19.15.36.14 paragraph 8 of Subsection C. This will incorporate 12 inches of compacted sand above top of oilfield waste material and then the installation of a 30-mil PVC liner as supplied and installed by Akome Inc. We will have 12 inches of sand on top of liner utilizing a 4% slope to aid in drainage. The final layer will be of native soil that will be re-seeded. Quotes from Sweatt Construction and Akome Inc. are attached showing the scope of their work with dirt work and liner installation.

We are also submitting a closure sampling process that will have an engineering firm sample all monitoring well quarterly for the first year after closure and semi-annually there after. This is more testing than is required as stated in 19.15.36.18 Subsection D paragraph 3. Attached is a cost estimate provided by Safety and Environmental Solutions Inc.

Upon closure of facility all fences will be checked for integrity and damaged. Repairs will be made if needed. Any temporary structures would be removed. Gates would be securely locked and postings of facility closure would be posted at entrance. This work would be done at the prevailing roustabout rate, currently $75.00, on a per hour basis.

Utilizing the cost estimates provided the approximate closure cost for the facility would be $97,234.37. This includes sampling of monitoring well for 30 years as stated in 19.15.36.18 Subsection D paragraph 3.

GCI d/b/a SWEATT CONSTRUCTION INC.
720 SOUTH TEXACO ROAD
HOBBS, NEW MEXICO 88240
(505) 393-3180 - FAX (505) 391-9895

GENERAL DIRT WORK
OIL FIELD ROADS - PITS - LOCATIONS

DECEMBER 28, 2007

ARTESIA AERATION INC.

ATTN: JIM WILSON OR LARRY PARKER

RE: LANDFILL CLOSURE AND RECLAMATION
LEA COUNTY, N.M.

WE WISH TO SUBMIT OUR BID TO FURNISH LABOR AND MATERIALS TO COVER USING ONSITE MATERIAL AND RE-SEED APPROXIMATELY 50 ACRES. USEING WATER TRUCK TO FACILITATE SEED GROWTH AS DIRECTED.

TOTAL BID PRICE	$28,620.00
TAX	1,538.33
TOTAL BID PRICE INCLUDING TAX	$30,158.33

SINCERELY,

KENDALL LIVINGSTON
VICE PRESIDENT
GCI d/b/a SWEATT CONSTRUCTION, INC.

THANK YOU FOR THE OPPORTUNITY TO BID ON THE ABOVE PROJECT.

KL/sp

AKOME INC.

419 West Cain
P.O. Box 2038
Hobbs, New Mexico
88241

Phone: 575-393-2910

Artesia Aeration Cost Estimate

The following is a cost estimate to close the proposed disposal pits located one mile west of Maljamar, New Mexico. The liner material of 30 mil thickness to be installed on top of pit with dimensions of 120 foot by 150 foot with 10 foot overlap will be as follows:

Labor and material (30 mil liner material)	$9,877.00
Tax	$679.04
TOTAL	$10,556.04

Transportation and labor expense included in quote.

Thank you for this opportunity and we look forward to working with you on this and future projects.

Jack Duffy

Per your request, here is a cost estimate in current dollars for water sampling at Artesia Aeration assuming all three wells need to be sampled:

Labor $275
Mileage $125
Equipment Rental (meter, pumps) $115
Sampling/Laboratory analysis (BTEX, TDS, Chloride) $405
Expendibles (twine, gloves) $20
Expendibles first sampling (bailers, tubing) $107.50

Summing this up, the first year sampling (quarterly) will be $1,047.50 + ($942 x 3) = $3,873.50 + tax
Each subsequent year, semi-annual sampling $942 x 2 = $1,884 + tax

These are cost estimates only based on current charges for the items listed above. SESI work is performed on a time and materials basis.

If you need further information, please let me know.

Dave

David G. Boyer, P.G.
Hydrogeologist
Safety and Environmental Solutions, Inc.
P.O. Box 1613
703 E. Clinton, Suite #102
Hobbs, NM 88241
office: 575-397-0510
fax: 575-393-4388
cell: 575-390-7067
email: dgboyer@sesi-nm.com

CONTINGENCY PLAN FOR ARTESIA AERATION

Artesia Aeration will be a solid oilfield waste only disposal facility. At no time will the disposal or storage of liquid oilfield waste be allowed. The contingency plan will reflect this fact. Any amendments to this contingency plan including changes of emergency coordinators, changes in facility design, and equipment changes will posted five (5) days prior to change. The division will be notified prior to changes for approval.

In the event of a fire the response action will be to immediately contain the fire in the area it occurs and the evacuation of personnel non-essential to the rehearsed response. The fire will be contained by the use of stored soils that surround the disposal pit. The fire department services will be called immediately on discovery or reporting of the fire. A listing of the fire response departments will be on display at the onsite disposal office as well as onsite personnel training for such emergencies. The emergency coordinator will make the additional reporting processes as necessary. The area immediately surrounding the disposal cells will have all ready been cleared of all vegetation which will help to isolate any fire hazard or spreading of fire. An alarm horn, with adequate volume, will be installed at disposal office which will be activated to alert personnel of emergency. An evacuation escape route and staging area will be posted prominently for employee and visitor information.

Fire extinguishers will be located at central location and at active disposal cell for extinguishing smaller fires. All fires will be reported promptly to the OCD division. Explosions will be responded to by the emergency coordinator by first evacuating all personnel to staging area located outside entrance to facility. He will immediately notify all appropriate fire departments, police agencies, and state and local response teams. Having no fluid stored or disposed of at the facility the danger of explosions and fires are lessoned greatly but our response training and vigilance to maintain a safe environment will not be lessoned.

Any emergency situation such as an explosion, fire, gas release, or release would constitute a temporary closing of the facility. The emergency coordinator would take the following steps:

1. Use notification system to alert personnel of emergency situation.
2. Alert all employees to shut down all equipment, electrical and mechanical and report to staging area east of facility.
3. Identify the character, exact source, amount, and extent of any released materials. This will be done by observation or review of facility records and, if necessary, by chemical analysis.
4. Concurrently assess possible hazards to human health and or the environment that may result from the release, fire, or explosion. This assessment will consider both direct and indirect effects.
5. Notify the appropriate state or local agencies if their help is needed. The agencies and contact numbers are listed below.
6. If the coordinator determines that the emergency could threaten health or the environment outside the facility he must report his findings as follows:
    a) If his assessment indicates that evacuation of local areas may be advisable, he must immediately notify appropriate authorities. He must be available to help the officials decide their course of action; and
    b) He must immediately notify the National Response Center (1-800-424-8802)
    c) The report will include the following:
    Name and phone number of the reporting party
    Name and address of the facility
    Time and type of incident(fire, explosion, etc.)
    Name and volume of materials involved
    The extent of injuries if any
    The possible hazards to human health, or the environment outside of the facility.

7. During the emergency, the coordinator must take all reasonable measures necessary to ensure that fires, explosions, or releases do not occur, or recur, or spread to other areas of facility. This could include stopping operations, collecting and containing releases, and removing or isolating materials.
8. Immediately after emergency, the Emergency Coordinator must provide for storing and disposing of recovered waste, contaminated

fluids, or any other material that results from a release, fire, or explosion at the facility.

9. The Coordinator must ensure that in the affected areas of the facility;
   a) No waste that may be incompatible with the released material is treated, stored, or disposed of until cleanup procedures are completed;and
   b) All emergency equipment listed in the contingency plan is cleaned and ready for use before operations are resumed.
10. The Emergency Coordinator must notify the Regional Administrator of the EPA, Region VI in Dallas Texas (214-606-6444) and the appropriate state (NM-EID 505-827-2926) and local (Lea County LEPC 505-397-3636) authorities that the facility is in compliance before operations may be resumed in the affected areas of the facility.
11. The Emergency Coordinator must document time, date, and details of any incident that requires implementing the contingency plan. Within 15 days after an incident the company must submit a written report on the incident to the EPA Regional Administrator, Region VI 1201 Elm Street, Dallas, Texas 75270 and the New Mexico Environmental Improvement Division, Hazardous Waste Bureau, 1190 St. Francis Drive, P.O. Box 968, Santa Fe, New Mexico 87504-0968. This report will include:
    a) Name, address, and telephone number of owner or operator.
    b) Name, address, and telephone number of the facility.
    c) Date, time, and type of incident (fire, explosion, release)
    d) Name and quantity of materials involved.
    e) The extent of any injuries.
    f) An assessment of actual or potential hazards to human health or the environment.
    g) Estimated quantity and disposition of recovered material that resulted from the incident.

Any release of contaminates because of excessive rains or flooding would be first contained be berm extensions and heightening efforts. The emergency coordinator would notify division within twenty-four hours following such an occurrence where the material breached the surrounding berms. The coordinator will also contact any appropriate state or local agencies within

the same time frame as needed. Containment of contamination would be ongoing with procedures to protect the health of personnel and the impact on the environment being the priority of the coordinator. Clean up of contamination would be started immediately upon determination of extent and approval of all agencies involved. Progress of cleanup would be reported daily with expected completion time frame included.

An explosion would constitute a closure of facility. After evacuation and notification a thorough investigation would determine cause and effect. Procedures would be instituted to alleviate any further dangers and prevent future incidents prior to re-opening facility.

Artesia Aeration will only be accepting solid non hazardous wastes such as contaminated soils, drilling operations waste, oilfield debris, and associated materials. We will be accepting no hazardous materials as demonstrated by C-138 that will accompany all materials disposed of at facility. Artesia Aeration will not be accepting any fluids for storage, disposal, or re-cycling.

Artesia Aeration will be using a chimney method to manage any gas accumulations that may arise. We will incorporate the use of slotted PVC chimney pipes through out our disposal cells. These pipes will be three (3) inch in diameter. They will be slotted and buried tem (10) foot below grade with three (3) foot above surface. These will help relieve any buildup of gas generated in the land fill. These chimneys will be monitored monthly using a multi-gas monitor. These readings will be logged and kept on site for evaluation and inspection by division. These monitoring systems will be left in place upon closure of disposal cell and will also be in place during a final closure plan.

The following is a listing of emergency phone numbers that will be posted in a prominent place within the onsite disposal office:

Lovington Fire Department	911	non emergency - 505-396-2359
Maljamar Fire Department	911	non emergency - 505-676-4100
Loco Hills Fire Department	911	non emergency - 505-746-5000
New Mexico State Police	911	non emergency - 505-392-5588
Lea County Sheriff	911	non emergency -505-393-2515
Lea County OCD office		non emergency - 505-393-6161
New Mexico DOT		non emergency- 505-887-0460

Lary Parker will be the **Emergency Coordinator** for Artesia Aeration
Address 1718 West Millen Drive, Hobbs New Mexico 88242
Home Phone Number 505-631-9252 Emergency Phone 505-631-6402

A second person will be designated secondary emergency coordinator when our permit is issued. Contact information will be forwarded to division office as well as response agencies at that time. Any changes or additions to these designees will be forwarded to the appropriate agencies.

Upon receipt of permit all pertinent information will be supplied to each of the emergency responders listed.

The following is a list of all emergency equipment to be on hand upon opening of disposal facility:
3- Fire extinguishers 2 eight pound and one twenty-five pound class ABC
5- H2S monitors
2- 73 piece first aid kits
2- 10 minute H2S escape packs
1- Alarm system located on office with volume to be heard for ½ mile.
(Alarm will be activated upon explosion, H2S high level, or fire.)
2- Wind socks to monitor wind direction. One located at entrance and one at active disposal cell

TRAINING PROGRAM

Artesia Aeration will conduct an annual training seminar for all key personnel. All operational systems will be discussed with training in areas that are related to each individual responsibility being addressed. Any changes that transpired will be discussed. Emergency operations and responsibilities will be reiterated with an evaluation of the previous year's progress. Sampling procedures will be discussed and results of previous year will be evaluated. Review of all paperwork and evaluation of the C-138's will be discussed. All minutes of these meetings will be recorded and kept on file for five (5) years.

All employees will receive training in RCRA general requirements with discussions on emergency response actions appropriate to the specific wastes handled at the facility.

All employees will receive training on proper use of fire extinguishing equipment as well as decontamination of spill control equipment.
All employees will participate in drills and evacuation procedures and their prospective assignments in the event of and emergency.

In addition to these training sessions we will also have monthly safety meetings that will be mandatory for all personnel. Safety issues will be addressed as well as safety training in such areas as H2S safety, first aid, fire fighting, heat stress, personal safety equipment, etc. During these meeting we will also discuss various aspects of our daily processes such as paperwork, waste sampling, and disposal cell maintenance. Records of these meeting will also be kept on record for inspection for five (5) years.

MONITOR WELL #2 ANALYSIS

An observation was made that monitor well #2 had water of an unknown source at a height of 26". While there is water in the monitor well it is believed that the water is not a viable potable water source. The geology of the area seems certain to be the cause of the water level and is not of any consequence.

Monitor well #2 is located 315' from our proposed disposal area which is well over the guidelines put forth in 19.15.36.13 NMAC. Monitor well #2 has a total depth of 40'. To alleviate any concerns about the standing water we decided to conduct several tests to help determine the source and amount of water we encountered.

First we decided to dig trench pits at various intervals around the well to determine from which direction the water was migrating from and determine the scope of any pool or flow. Attached is map M1 which shows the location of all trenches. Chart C1 shows the GPS location of all trenches and chart C2 shows observations of trenches.

All trenches were dug to minimum of 40' in depth with an average length of 50'. These trenches were dug using a step down method for safety operations and were dug without incident. We left the trenches open as we continue to monitor the conditions of each.

We also decided to to take daily measurements of the water height in MW2 at the approximate same time each day. Additionally we decided to bail the well dry daily at the same time. Chart D1 shows the daily log and results that were kept as well as the temperature and weather conditions.

Included is chart M2 which is an aerial photo of Artesia Aeration which helps illustrate the surrounding geology and helps us make our conclusions of the source of the water encountered in MW2.

Monitor well 1, well 3, and well 4, all continue to have no detection of any water. Monitor well #3 was drilled in the anticipated disposal area to a depth of 160' with no detection of water, of which all conclusions of this proposed site should be decided upon.

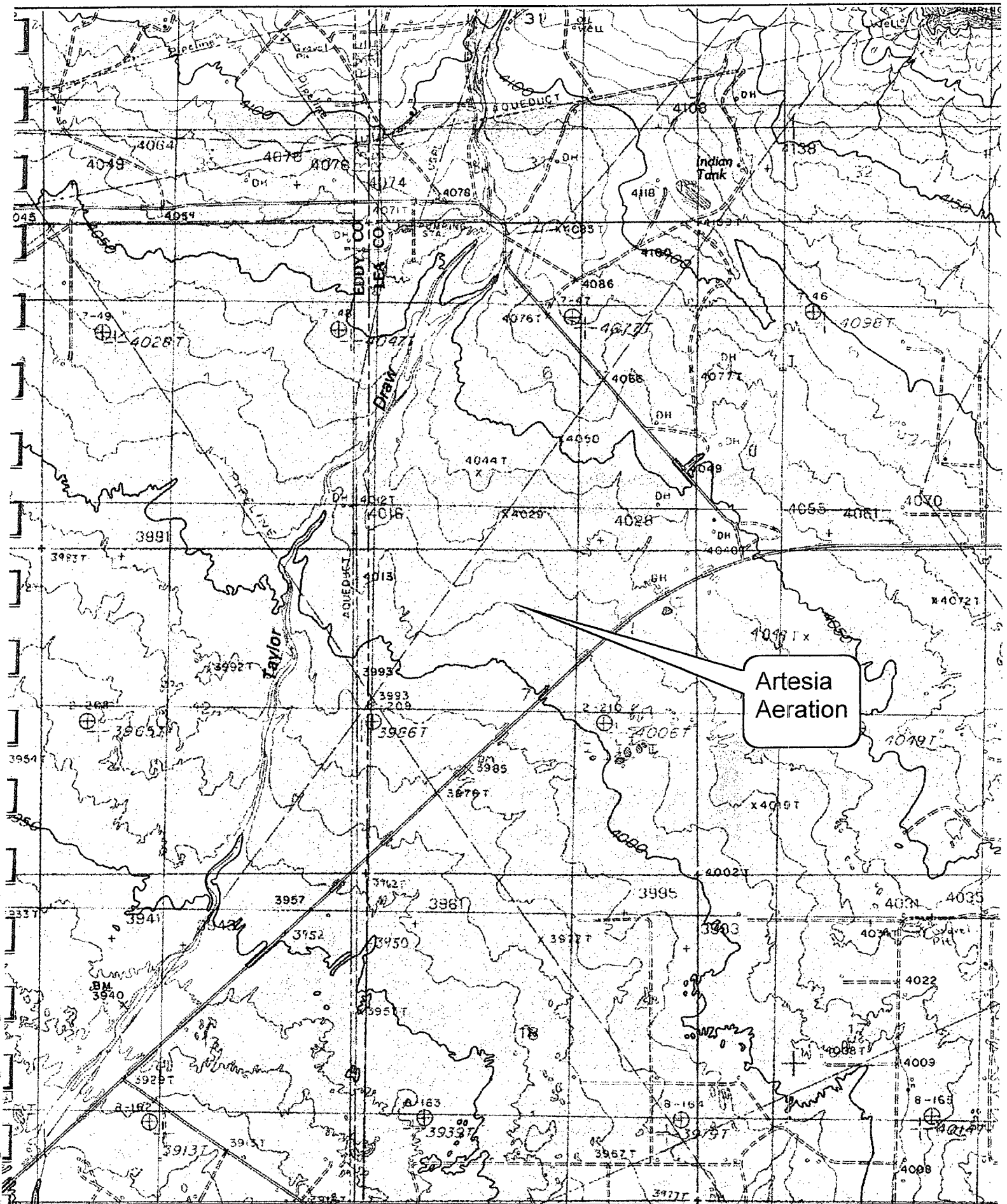
CONCLUSION OF MOITOR WELL #2

We contend that water found in monitor well #2 is a non-viable non-potable water source. The water indicated in the monitor well is well outside the guidelines set forth by 13.15.36.13 NMAC of 200 foot. The level of the well remains somewhat constant and only fluctuates with the environmental changes such as rain or snow. There is a natural funnel effect that comes into play upon examination of the aerial photo showing the natural geology and contours of the area to the northeast of the well. We theorize that the water encountered in monitor well 2 is the result of waters that follow the natural contours of the landscape and happens to funnel into an area that accumulates around the well.

There were three exploratory trenches dug on the eastern side of our proposed disposal site. These trenches were dug to a depth of 40' plus to prove the water source in monitor well 2 is in no way under our site. Monitor well #3 gives ample proof and evidence that there is no water in any form or way under our proposed disposal site.

In our research results and our opinion the water identified in monitor well #2 is the result of accumulations of storm waters that will migrate to the lowest place from the higher elevations of the areas to the northeast from the caprock area. The aerial photo following this conclusion helps illustrates the funneling effect.

Therefore Artesia Aeration contends that our proposed disposal facility will in no way pose any threat to the environment, water sources, or ecology of the surrounding area. As noted in the Groundwater Investigation Report supplied by Safety and Environmental Solutions, Inc., pages 3 and 4 their conclusion is parallel to ours and indicates "the lack of groundwater at the facility except at MW-2 demonstrates the suitability for its current and proposed use, especially with the engineering controls (synthetically-lined impoundments) that will be part of the facility design".



Name: MALJAMAR
Date: 1/29/2008
Scale: 1 inch equals 2000 feet

Location: 032° 51' 14.23" N 103° 48' 26.25" W NAD 83
Caption: Figure 1. Location Map, Artesia Aeration, Lea County, New Mexico

CHART C-1

TRENCH 1	32deg N 51' 07.9" 103deg W 48' 14.5"
TRENCH 2	32deg N 51' 07.5" 103deg W 48' 13.6"
TRENCH 3	32deg N 51' 07.5" 103deg W 48' 13.6"
TRENCH 4	32deg N 51' 08.8" 103deg W 48' 11.5"
TRENCH 5	32deg N 51' 10.1" 103deg W 48' 09.5"
TRENCH 6	32deg N 51' 07.1" 103deg W 48' 12.4"
TRENCH 7	32deg N 51' 07.8" 103deg W 48' 15.3"
TRENCH 8	32deg N 51' 08.7" 103deg W 48' 14.8"
TRENCH 9	32deg N 51' 05.3" 103deg W 48' 16.3"
TRENCH 10	32deg N 51' 05.9" 103deg W 48' 17.2"
TRENCH 11	32deg N 51' 09.5" 103deg W 48' 19.3"
TRENCH 12	32deg N 51' 13.4" 103deg W 48' 17.5"

MONITOR WELL #2 IS LOCATED AT 32DEG N 51' 13.4" 103DEG W 48' 13.9" FOR REFERENCE

CHART C-2

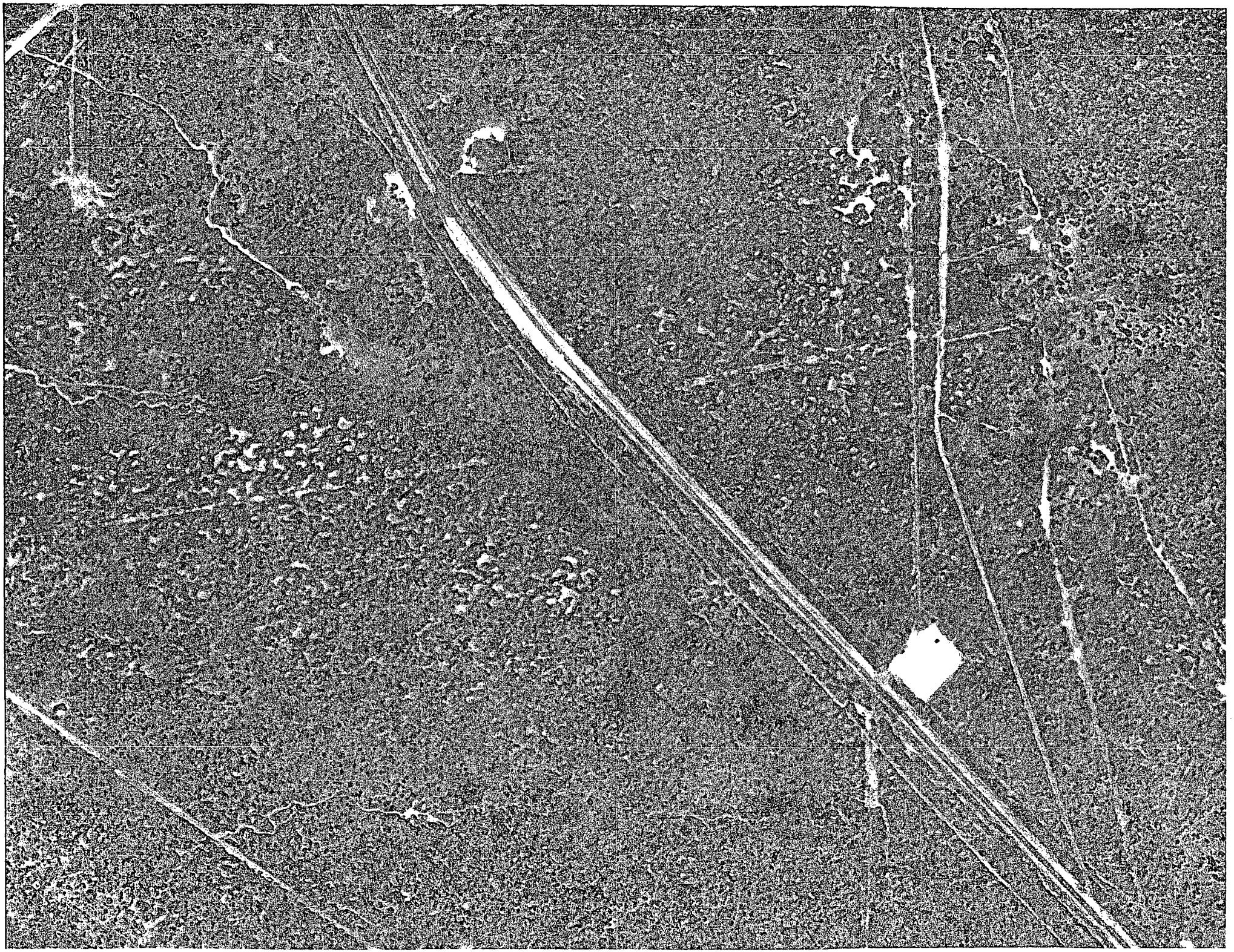
We began digging the observation trenches on February 2, 2008. Wayne Price and Brad Jones with the OCD came to evaluate the results and progress of the pits on February 20, 2008 and wrote summary of their visit dated February 21, 2008

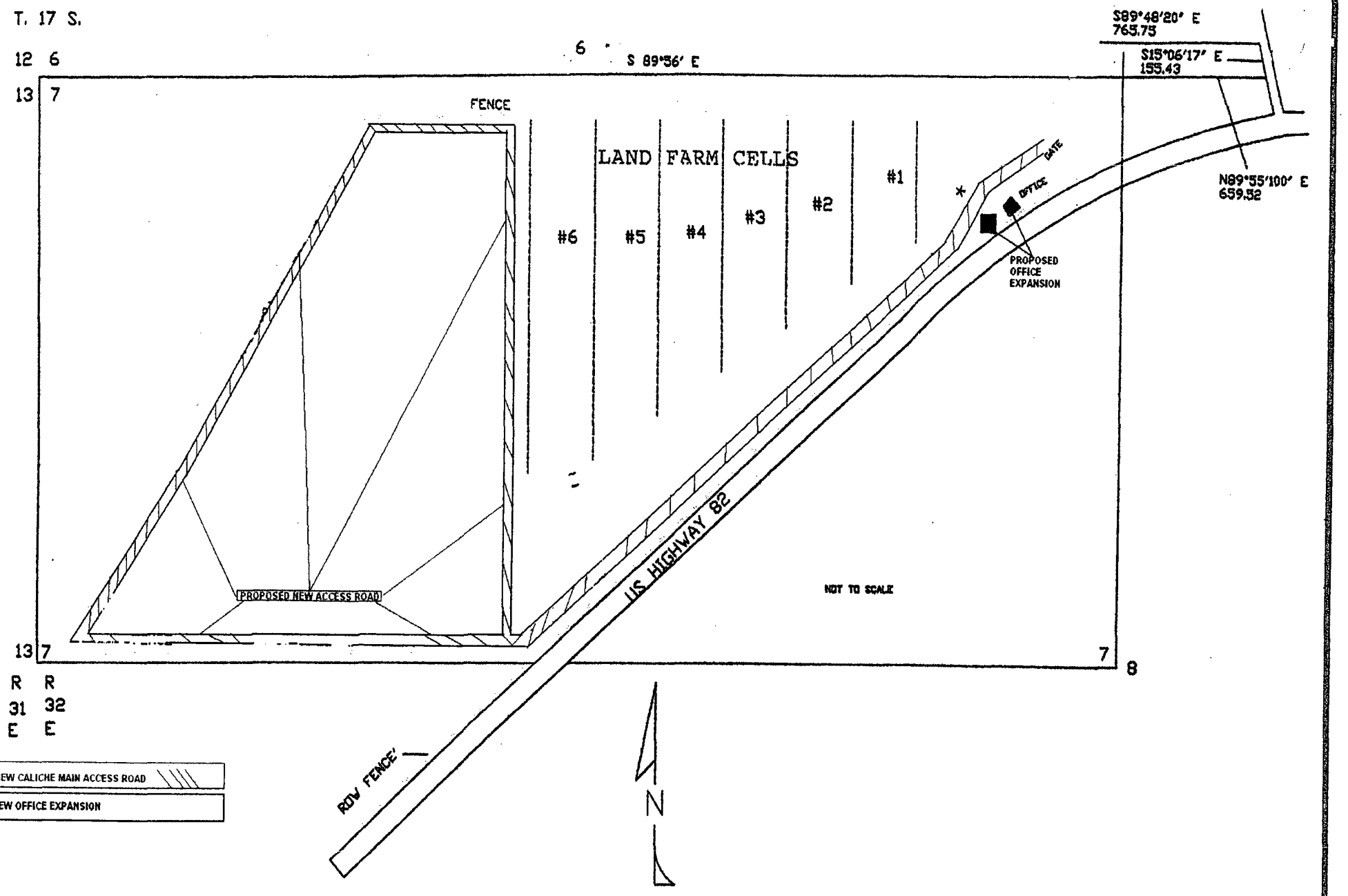
When trench numbers 1, 2, 3, 4, and 7 were dug we encounter moist soil at 37 foot. We continued digging until approximately 40 foot. Overnight water drained into trenches to the height of about 1.5 foot. Trench 8 had no show of moisture or water until second day after digging. Water level rose to about 18" and has not varied to date.

Trenches 5, 9, 10, 11, and 12 had no show of moisture and had no water drain into trench and remain dry today.

The trenches were observed daily during the time the monitor well was bailed out. The water level dropped on all well having standing water. On 3/06/08 the level in trench 7 had dropped to no standing water. The levels on the other 5 trenches had declined to about 1 foot of standing water. On March 24 only pit #8 had any significant standing water with a level of less than one foot. Trenches 1, 2, 3, 4, and 7 had dampness at bottom of trench, but no standing water.

Our conclusions are explained and summarized under the conclusion tab.

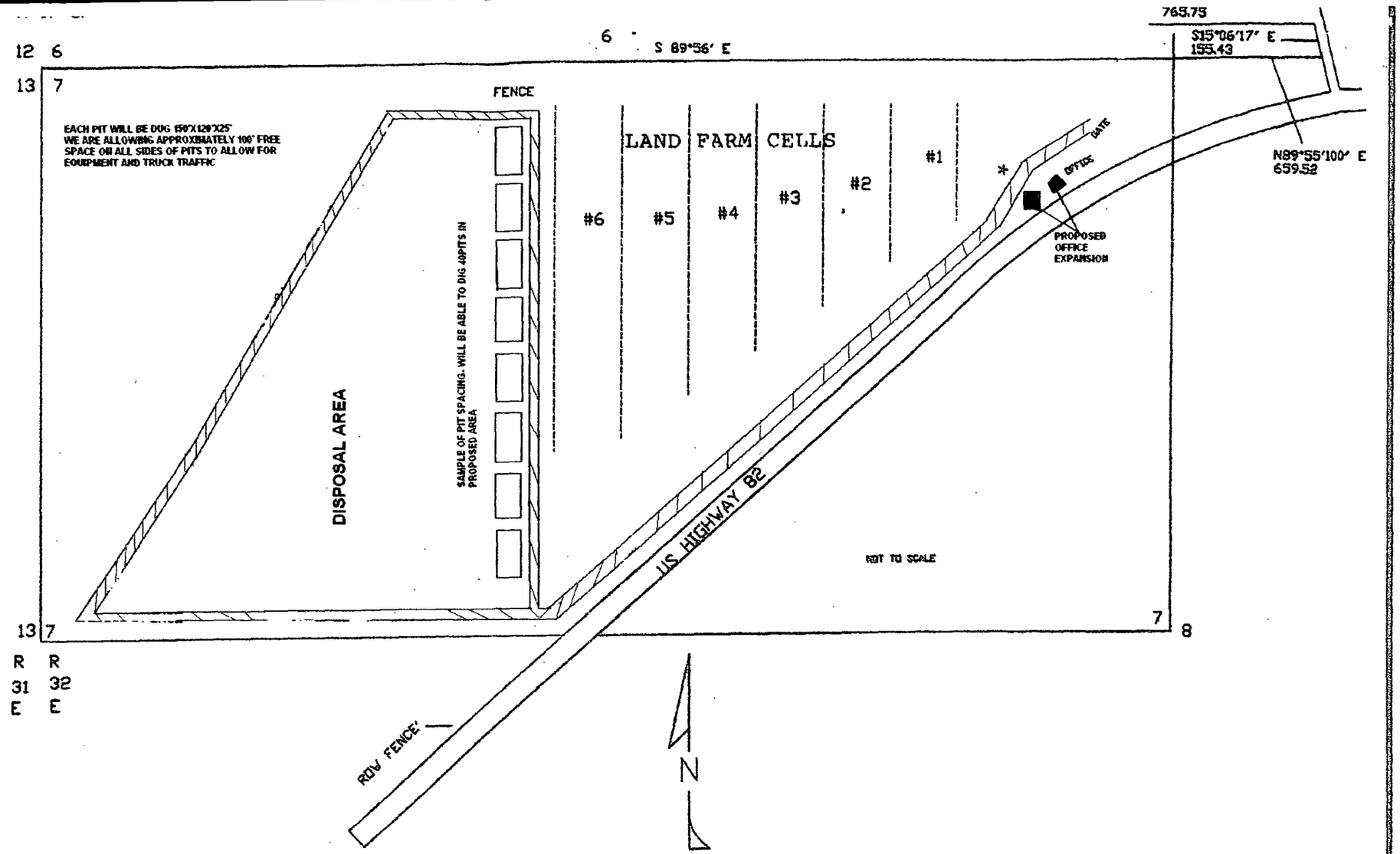




GPS #
32°-51'-17.1"N
103°-47'-56.9"W
ELEVATION: 4038

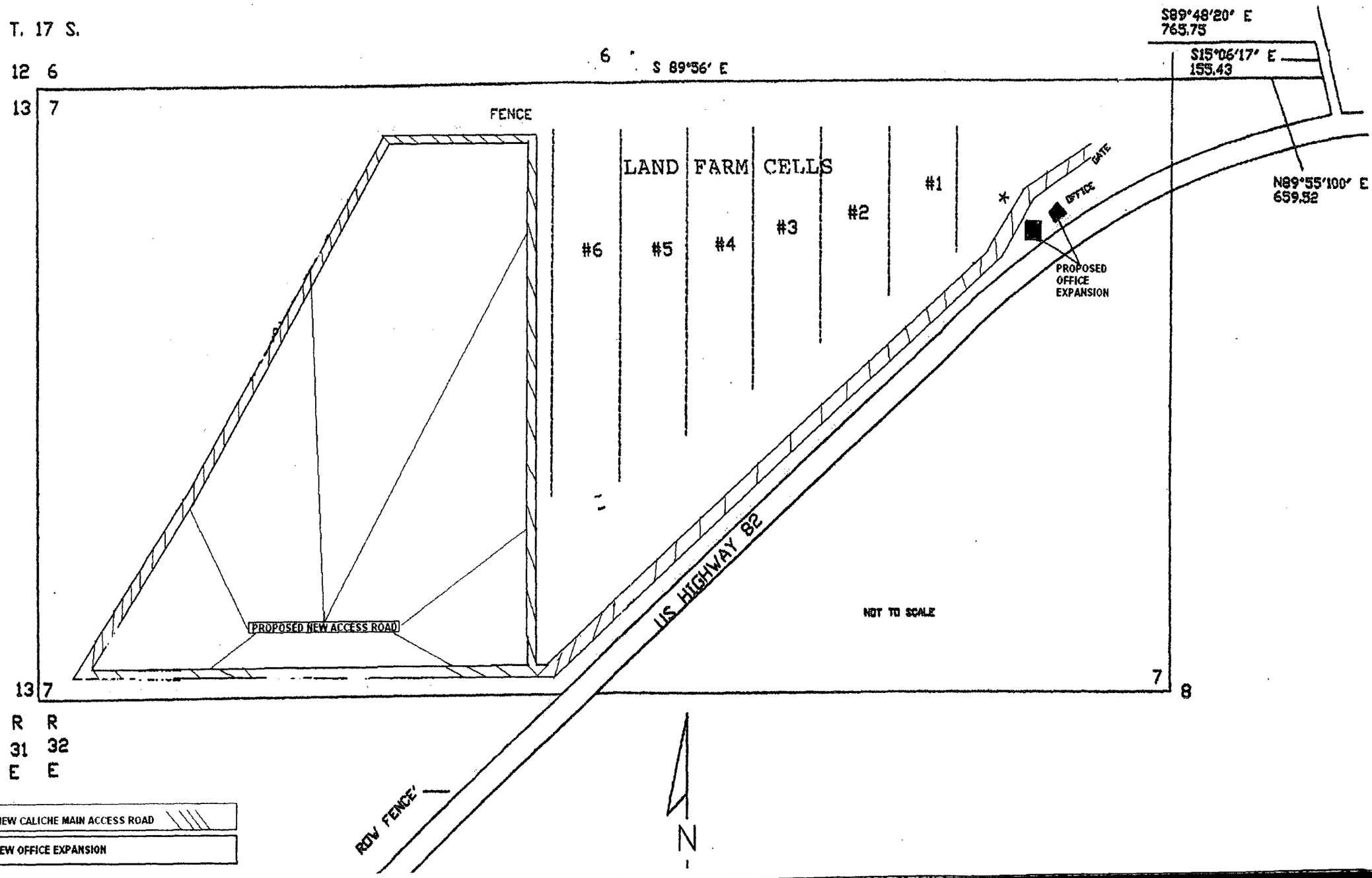
ARTESIA AERATION LLC

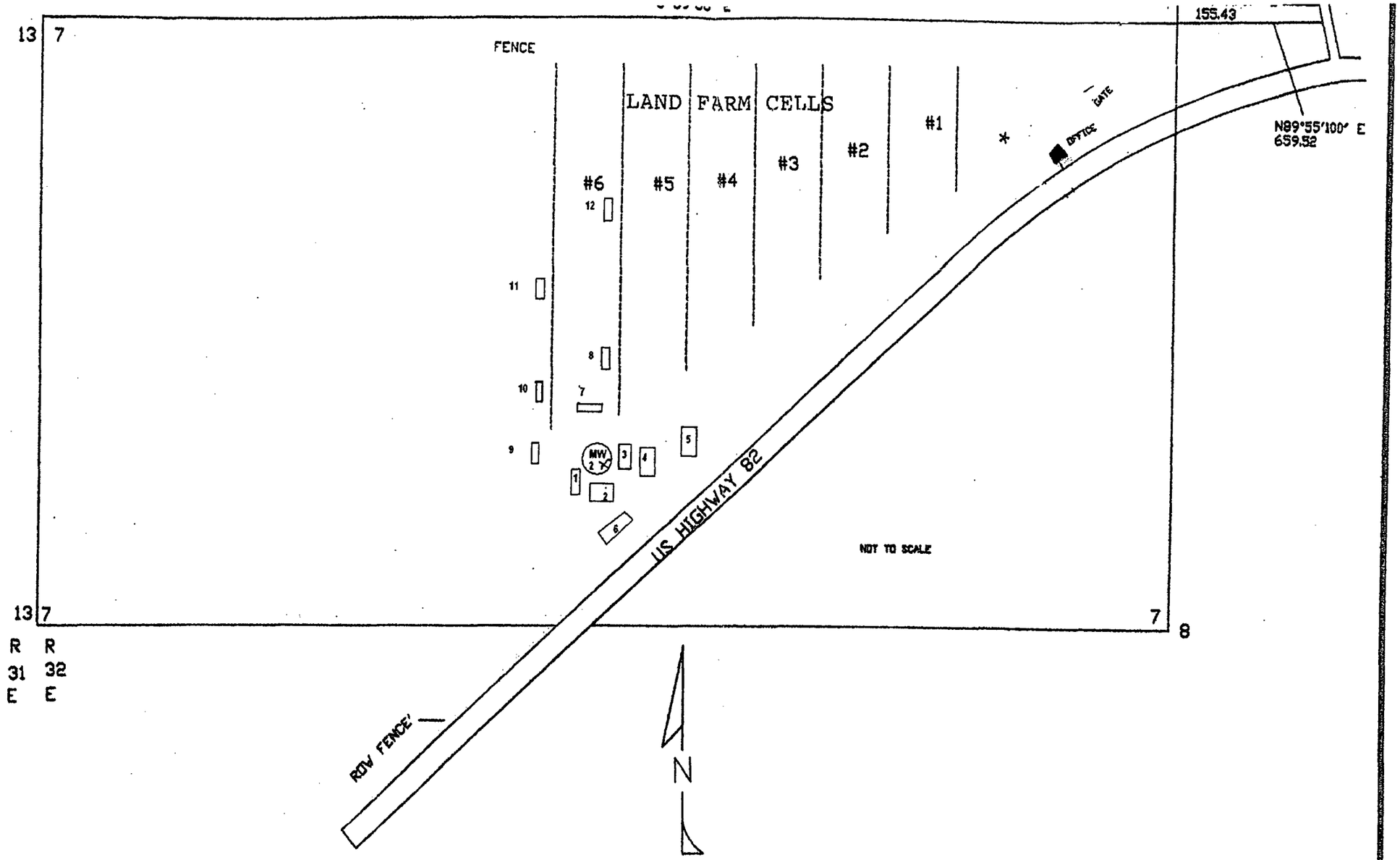
SECTIONS 5, 6 AND 7
TOWNSHIP 17 SOUTH, RANGE 32 EAST
N.M.P.M., LEA COUNTY, NEW MEXICO



ARTESIA AERATION LLC

GPS # 32°-51'-17.1"N 103°-47'-56.9"W ELEVATION: 4039	ARTESIA AERATION LLC	SECTIONS 5, 6 AND 7 TOWNSHIP 17 SOUTH, RANGE 32 EAST N.M.P.M., LEA COUNTY, NEW MEXICO

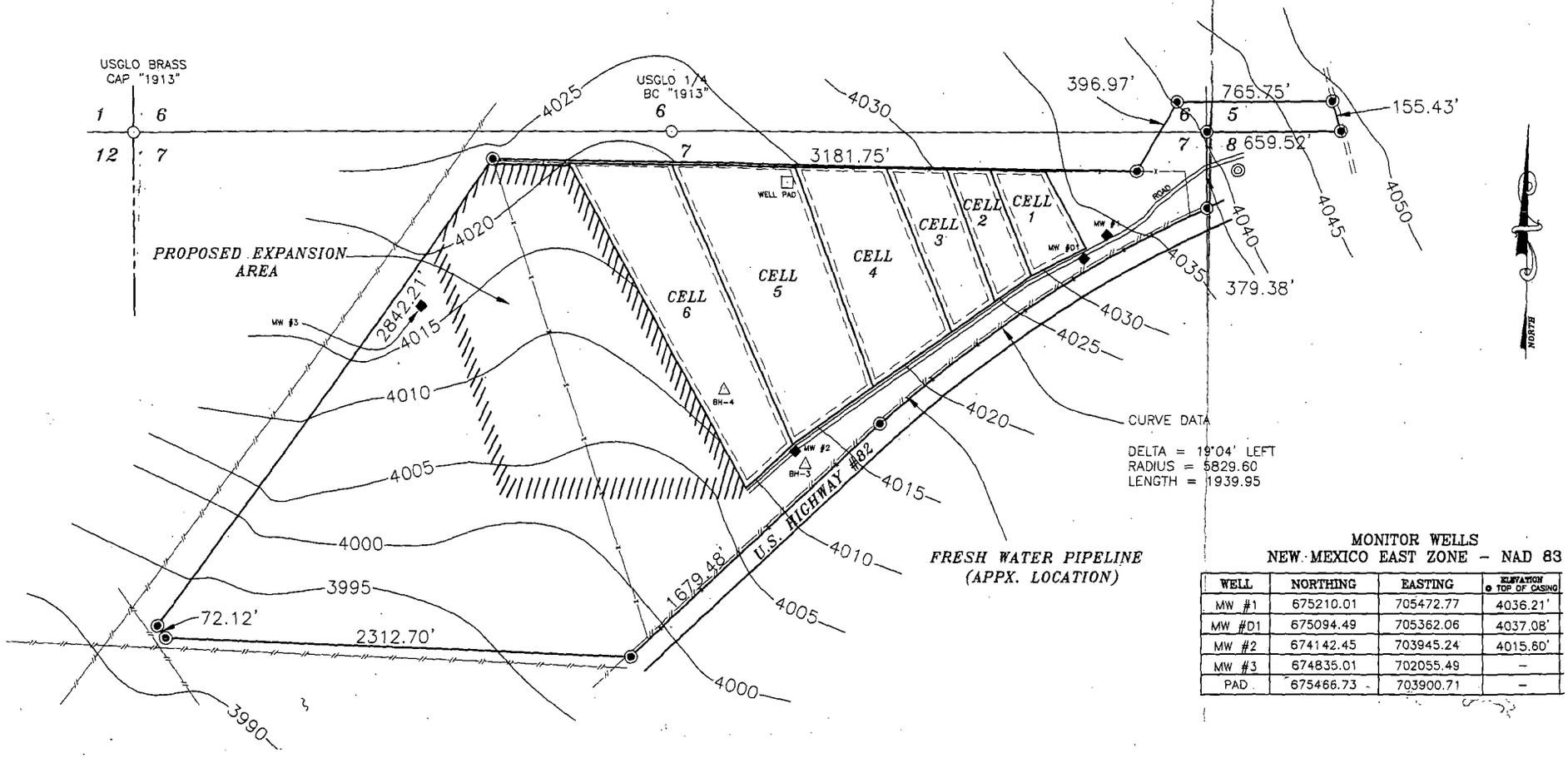

T. 17 S.
12 6
13 7
6
S 89°56' E
S89°48'20" E
765.75
S15°06'17" E
155.43
N89°55'100" E
659.52
FENCE
LAND FARM CELLS
#1
#2
#3
#4
#5
#6
GATE
OFFICE
PROPOSED OFFICE EXPANSION
PROPOSED NEW ACCESS ROAD
US HIGHWAY 82
NOT TO SCALE
ROW FENCE
7
8
13 7
R 31 E
R 32 E
N
PROPOSED NEW CALICHE MAIN ACCESS ROAD
PROPOSED NEW OFFICE EXPANSION



ARTESIA AERATION LLC

GPS # 32°-51'-17.1"N 103°-47'-56.9"W ELEVATION: 4039	ARTESIA AERATION LLC	SECTIONS 5, 6 AND 7 TOWNSHIP 17 SOUTH, RANGE 32 EAST N.M.P.M., LEA COUNTY, NEW MEXICO RIDER ENVIRONMENTAL

TOPOGRAPHIC SURVEY OF ARTESIA AERATION LLC LAND FARM IN SECTIONS 5, 6, & 7, TOWNSHIP 17 SOUTH, RANGE 32 EAST, N.M.P.M., LEA COUNTY, NEW MEXICO



CURVE DATA

DELTA = 19°04' LEFT
RADIUS = 5829.60
LENGTH = 1939.95

MONITOR WELLS
NEW MEXICO EAST ZONE – NAD 83

WELL	NORTHING	EASTING	ELEVATION @ TOP OF CASING
MW #1	675210.01	705472.77	4036.21'
MW #D1	675094.49	705362.06	4037.08'
MW #2	674142.45	703945.24	4015.60'
MW #3	674835.01	702055.49	–
PAD	675466.73	703900.71	–

NOTES:
HORIZONTAL COORDINATES WERE ESTABLISHED BY USING GPS (GLOBAL POSITIONING SYSTEM). AND ARE NEW MEXICO EAST ZONE, NAD 83, U.S. SURVEY FEET VALUES.

ELEVATIONS WERE ESTABLISHED BY CONVENTIONAL LEVELING BASED OFF MONUMENT "WILSON", ELEVATION OF 4042.99' (NAVD 88).

TERRY J. ASEL NEW MEXICO 15079 REGISTERED PROFESSIONAL LAND SURVEYOR

SURVEYORS CERTIFICATE

I, TERRY J. ASEL, NEW MEXICO PROFESSIONAL SURVEYOR NO. 15079, DO HEREBY CERTIFY THAT I CONDUCTED AND AM RESPONSIBLE FOR THIS SURVEY, THAT THIS SURVEY IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF, AND MEETS THE "MINIMUM STANDARDS FOR SURVEYING IN NEW MEXICO" AS ADOPTED BY THE NEW MEXICO STATE BOARD OF REGISTRATION FOR PROFESSIONAL ENGINEERS AND SURVEYORS.

Terry J. Asel 1/29/2008
Terry J. Asel / N.M. R.P.S. No. 15079

LEGEND

◆ – DENOTES MONITOR WELL
△ – DENOTES BORE HOLE
◉ – DENOTES PROPERTY CORNER
◎ – DENOTES SET 1/2" REBAR W/PVC CAP MARKED ASEL CONTROL PT. (WILSON) BENCHMARK FOR ELEVATIONS

Asel Surveying & Consulting
P.O. BOX 393 – 310 W. TAYLOR
HOBBS, NEW MEXICO – 505-393-9146

500' 0 500' 1000' FE
SCALE: 1"=500'

ARTESIA AERATION LL

TOPOGRAPHIC SURVEY OF ARTESIA AERATION LLC LA FARM IN SECTIONS 5, 6, & 7, TOWNSHIP 17 SOUT RANGE 32 EAST, N.M.P.M., LEA COUNTY, NEW MEXIC

Survey Date: 08/08/2007	W.O. Number: 070808MW-
	File: 070808MW-REV.C.DWG
Date: 01/29/2008	Drafted By: KA

NEW MEXICO ENERGY, MINERALS and NATURAL RESOURCES DEPARTMENT

BILL RICHARDSON
Governor
Joanna Prukop
Cabinet Secretary

Mark E. Fesmire, P.E.
Director
Oil Conservation Division

February 21, 2008

Mr. Jim Wilson
Artesia Aeration, LLC
PO Box 310
Hobbs, New Mexico 88240

RE: Summary of February 20, 2008 Artesia Aeration Site Visit and February 21, 2008 Follow-up Phone Call Regarding Ground Water Assessment for Proposed Permit Modification at Artesia Aeration: Permit NM-01-0030
Location: Section7, Township 17 South, Range 32 East, NMPM
Lea County, New Mexico

Dear Mr. Wilson:

The New Mexico Oil Conservation Division (OCD) appreciates Artesia Aeration's effort to include the OCD in the progress of the site assessment regarding ground water investigation for the proposed modification. The OCD would like to provide you with a brief summary of the items observed and discussed during the February 20, 2008 site visit and the follow-up telephone conversation on February 21, 2008.

Observations:

OCD representatives (Wayne Price and Brad Jones) observed the presence of water and damp/wet soil in six of the eleven exploratory trenches excavated within the proximity of the MW-2. OCD also retrieved a full 3-foot bailer of water from MW-2 during the visit.

- Trench #1 had damp/wet soil at the bottom due to sidewall of trench caving in. Sidewalls indicated dampness approximately 4-5 feet above bottom of trench.
- Trench #2 had approximately 1-1.5 feet of standing water present at the bottom of the trench. Sidewalls indicated dampness approximately 2-3 feet above water line.
- Trench #3 had damp soil at the bottom due to sidewall of trench caving in. Trench #3 had approximately 1-1.5 feet of standing water present at the bottom on February 7, 2008 site visit. Sidewalls indicated dampness approximately 4-5 feet above water line.
- Trench #4 had approximately 0.5-1 feet of standing water present at the bottom of the trench. Sidewalls indicated dampness approximately 2-3 feet above water line.
- Trench #5 was dry at the bottom of the trench.
- Trench #6 was dry at the bottom of the trench.
- Trench #7 had approximately 2-3.5 feet of standing water present at the bottom of the trench. Sidewalls indicated dampness approximately 5-7 feet above water line.
- Trench #8 had approximately 1-2 feet of standing water present at the bottom of the trench. Sidewalls indicated dampness approximately 3-4 feet above water line.
- Trench #9 was dry at the bottom of the trench.
- Trench #10 was dry at the bottom of the trench.

- Trench #11 was dry at the bottom of the trench.

The approximate depth of each trench was noted in OCD's field notes. OCD took photos of each trench and surrounding features. An abandoned oil/gas well was noted and logged into the field notes. The well was in close proximately to the MW-D1. The dry hole marker was hard to read and was logged in as being in se/4 se/4 section 6-Ts17s-R32e Mitchell G Lea County, Rider Scott co.

OCD representatives observed the progress of the removal of DAF material from the dedicated Navajo Refinery landfarm cell. OCD had recently discovered that this material was not approved for this landfarm. Mr. Brad Jones performed a site inspection and record review concerning this issue on February 07, 2008. A berm has been constructed around the remaining material awaiting removal. Dusty Wilson, a representative for Artesia Aeration, informed OCD that the material was being transported to CRI for proper disposal. OCD took a photo.

After the site visit, OCD drove the outside perimeter of the facility including the proposed landfill area to observe the nature and extent of surrounding surface features including surface water run-on and run-off areas. OCD was able to match the small arroyos or ditches with the aero photo supplied to us.

Items discussed during the February 20, 2008 site visit:

Dusty Wilson, a representative for Artesia Aeration, provided OCD a site tour and overview of the exploratory trenches. During the tour, Mr. Wilson expressed that the trackhoe operator observed water entering trenches 7 and 8 from the direction of MW-2. Mr. Wilson provided OCD with a site map (Topographic Survey of Artesia Aeration dated 1/29/08) with the approximate locations and depths of each excavated trench. Additional information on the map indicated the presence of water and the amount of time for the water to develop in the trench.

OCD requested a site map that would depict the exact location of each trench and its distance from MW-2. OCD also expressed the importance of mapping the geologic strata across the site, based upon the observed geology of each trench.

Dusty Wilson, a representative for Artesia Aeration, expressed interest to use additional exploratory trenches to investigate the proposed area of the modification. Mr. Wilson inquired about locations for additional trenches and provided a site map indicating the locations. OCD expressed the ability to trench to appropriate depths and the ability of the results of the work to support the proposal. Based upon the conversation, it was OCD understanding that Artesia Aeration was undecided about the technique in which the investigation would continue.

Dusty Wilson and Larry Parker provided OCD a rational why shallow groundwater may be present. They concluded that surface storm water coming from the north and east drainages may have been trapped in the area of MW-2 due to the elevation of the highway. Mr. Parker noted that some years ago there was a large rainfall event in that area which caused flooding and closure of highway 82.

Items discussed during the February 21, 2008 telephone call:

OCD (Wayne Price and Brad Jones) contacted Mr. Dusty Wilson to clarify items discussed during the February 20, 2008 site visit. OCD indicated that the rules specify there must be a 100 foot separation between the bottom of the landfill and groundwater, however the rule does not express a horizontal distance from groundwater, but there are other siting requirements in addition to the 100 foot rule. OCD expressed its concern that trenching may provide valuable information concerning shallow groundwater

but, it would not adequately demonstrate if there is deeper groundwater underlying the site. While Artesia Aeration has drilled one deep monitor well on the northwest side of the proposed landfill area, OCD indicated that one well will not be sufficient to demonstrate that no groundwater exist under the entire site.

In order to assist Artesia Aeration and to prevent the "moving target syndrome" OCD recommended that Artesia Aeration and their hydrologist or geohydrologist schedule a meeting with OCD to establish a plan to properly characterize the geology and groundwater beneath the area proposed in the modification prior to taking any further action. The goal is to establish an assessment plan that will provide the appropriate information to determine if the site is viable for the pursuit of the proposed modification. Mr. Wilson expressed his concern that additional work would be very expensive and may cost as much as $100,000. OCD pointed out that is the exact reason we need to have a technical meeting so Artesia understands what the rule requires and what will satisfy those requirements.

The OCD hopes that this summary will help clarify any outstanding issues and looks forward to our meeting. If you have any questions regarding this matter, please do not hesitate to contact Brad A. Jones of my staff at 505) 476-3487 or brad.a.jones@state.nm.us.

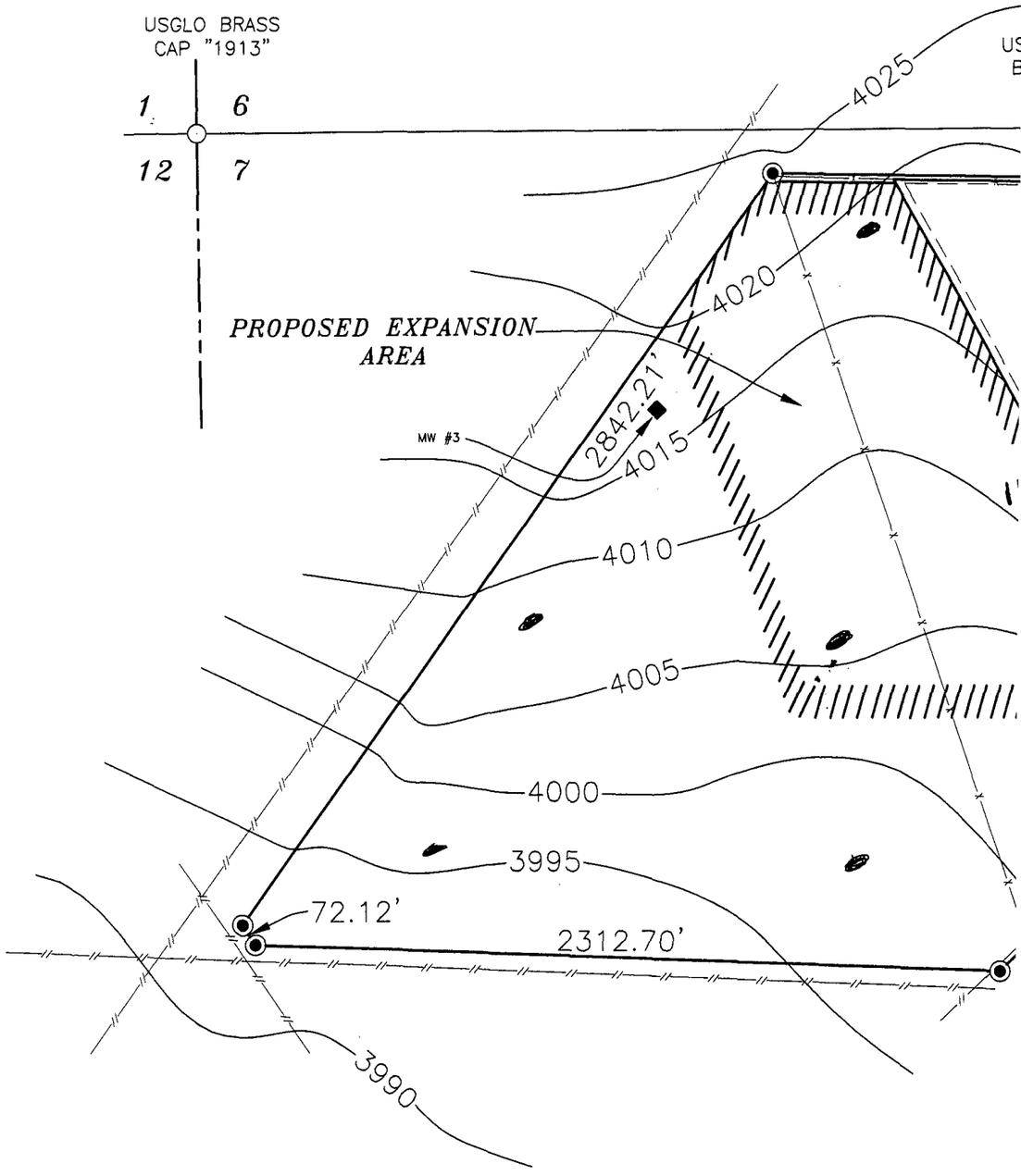
Sincerely,

Wayne Price
Environmental Bureau Chief

LWP/baj

cc: OCD District I Office, Hobbs

TOPOGRAPHIC SURVEY O
SECTIONS 5, 6, & 7, TOWN
LEA



TERRY J. ASEL
NEW MEXICO
15079
REGISTERED PROFESSIONAL LAND SURVEYOR

SURVEYORS CERTIFICATE

I, TERRY J. ASEL, NEW MEXICO PROFESSIONAL SURVEYOR NO. 15079, DO HEREBY CERTIFY THAT I CONDUCTED AND AM RESPONSIBLE FOR THIS SURVEY, THAT THIS SURVEY IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF, AND MEETS THE "MINIMUM STANDARDS FOR SURVEYING IN NEW MEXICO" AS ADOPTED BY THE NEW MEXICO STATE BOARD OF REGISTRATION FOR PROFESSIONAL ENGINEERS AND SURVEYORS.

Terry J. Asel 1/29/2008

Terry J. Asel N.M. R.P.S. No. 15079

LEGEND

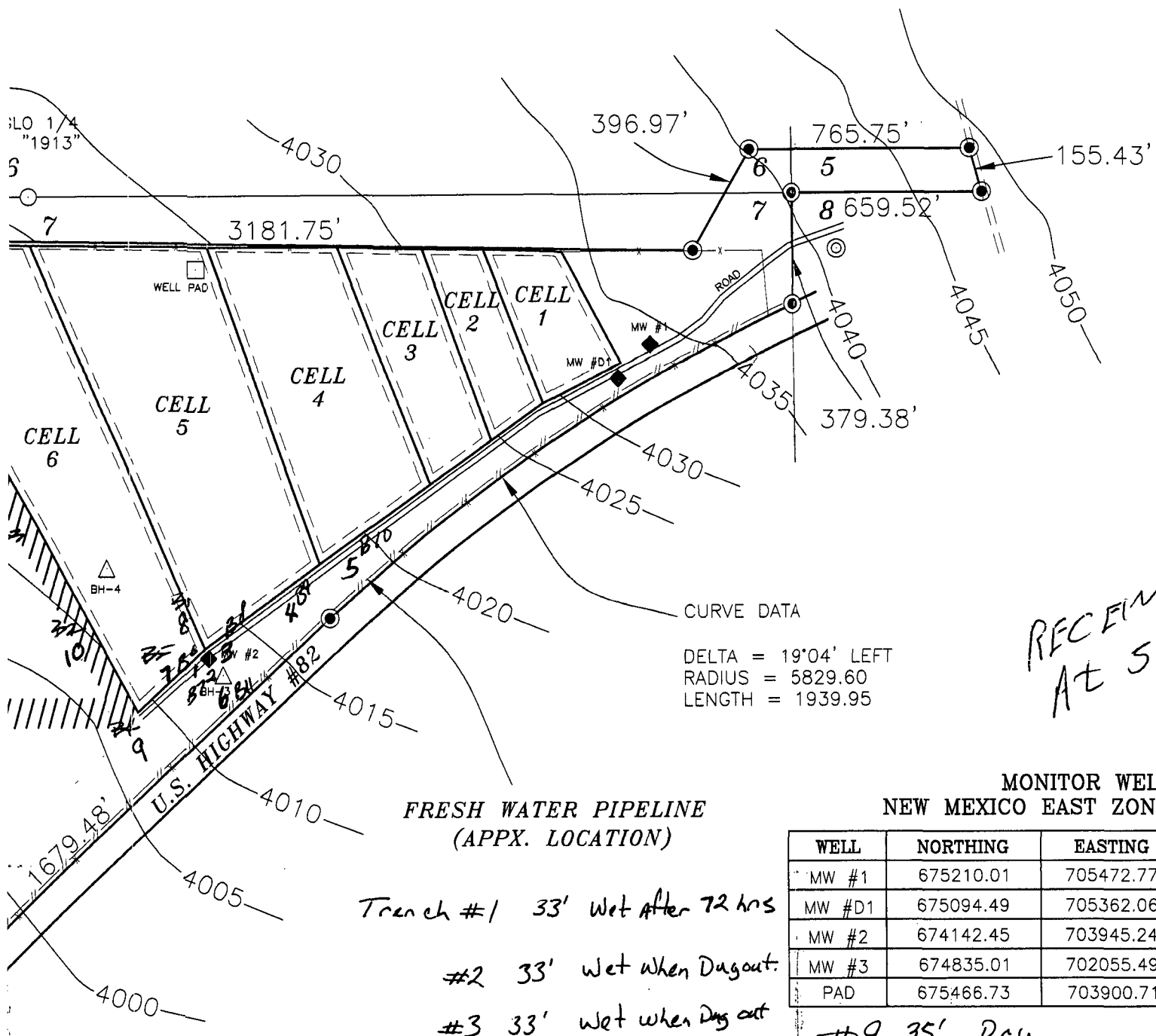
◆ – DENOTES MONITOR WELL

△ – DENOTES BORE HOLE

◉ – DENOTES PROPERTY CORNE

◎ – DENOTES SET 1/2" REBAR MARKED ASEL CONTROL PT. BENCHMARK FOR ELEVATION

ARTESIA AERATION LLC LAND FARM IN SHIP 17 SOUTH, RANGE 32 EAST, N.M.P.M., COUNTY, NEW MEXICO



CURVE DATA

DELTA = 19°04' LEFT
RADIUS = 5829.60
LENGTH = 1939.95

RECEIVED ON FEB 20, 2008
At Site

FRESH WATER PIPELINE (APPX. LOCATION)

Trench #1 33' Wet after 72 hrs

#2 33' Wet when Dugout

#3 33' Wet when Dug out

#4 31' Wet after 5 days

#5 31' Dry

#6 34' Dry

#7 28' Dry for 3 days water came in after cave off

#8 32' " "

#9 35' Dry

#10 40' Dry

#11 40' Dry

MONITOR WELLS
NEW MEXICO EAST ZONE – NAD 83

WELL	NORTHING	EASTING	ELEVATION @ TOP OF CASING	GROUND ELEVATION
MW #1	675210.01	705472.77	4036.21'	4032.91'
MW #D1	675094.49	705362.06	4037.08'	4032.40'
MW #2	674142.45	703945.24	4015.60'	4012.42'
MW #3	674835.01	702055.49	–	–
PAD	675466.73	703900.71	–	4028.37'

NOTES:
HORIZONTAL COORDINATES WERE ESTABLISHED BY USING GPS (GLOBAL POSITIONING SYSTEM). AND ARE NEW MEXICO EAST ZONE, NAD 83, U.S. SURVEY FEET VALUES.

ELEVATIONS WERE ESTABLISHED BY CONVENTIONAL LEVELING BASED OFF MONUMENT "WILSON", ELEVATION OF 4042.99' (NAVD 88).

/PVC CAP
WILSON)

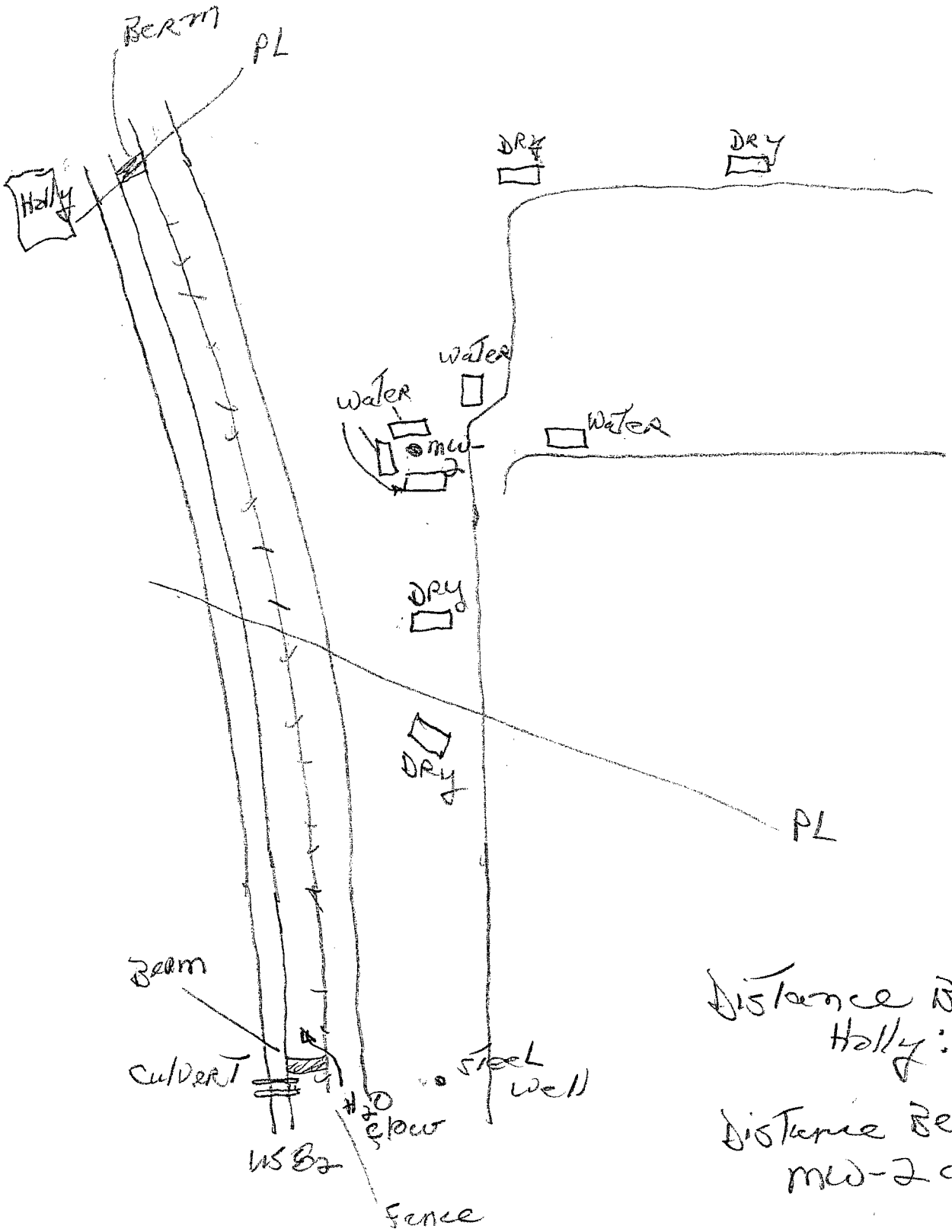
500' 0 500' 1000' FEET
SCALE: 1"=500'

Asel Surveying & Consulting
P.O. BOX 393 – 310 W. TAYLOR
HOBBS, NEW MEXICO – 505-393-9146

ARTESIA AERATION LLC

TOPOGRAPHIC SURVEY OF ARTESIA AERATION LLC LAND FARM IN SECTIONS 5, 6, & 7, TOWNSHIP 17 SOUTH, RANGE 32 EAST, N.M.P.M., LEA COUNTY, NEW MEXICO.

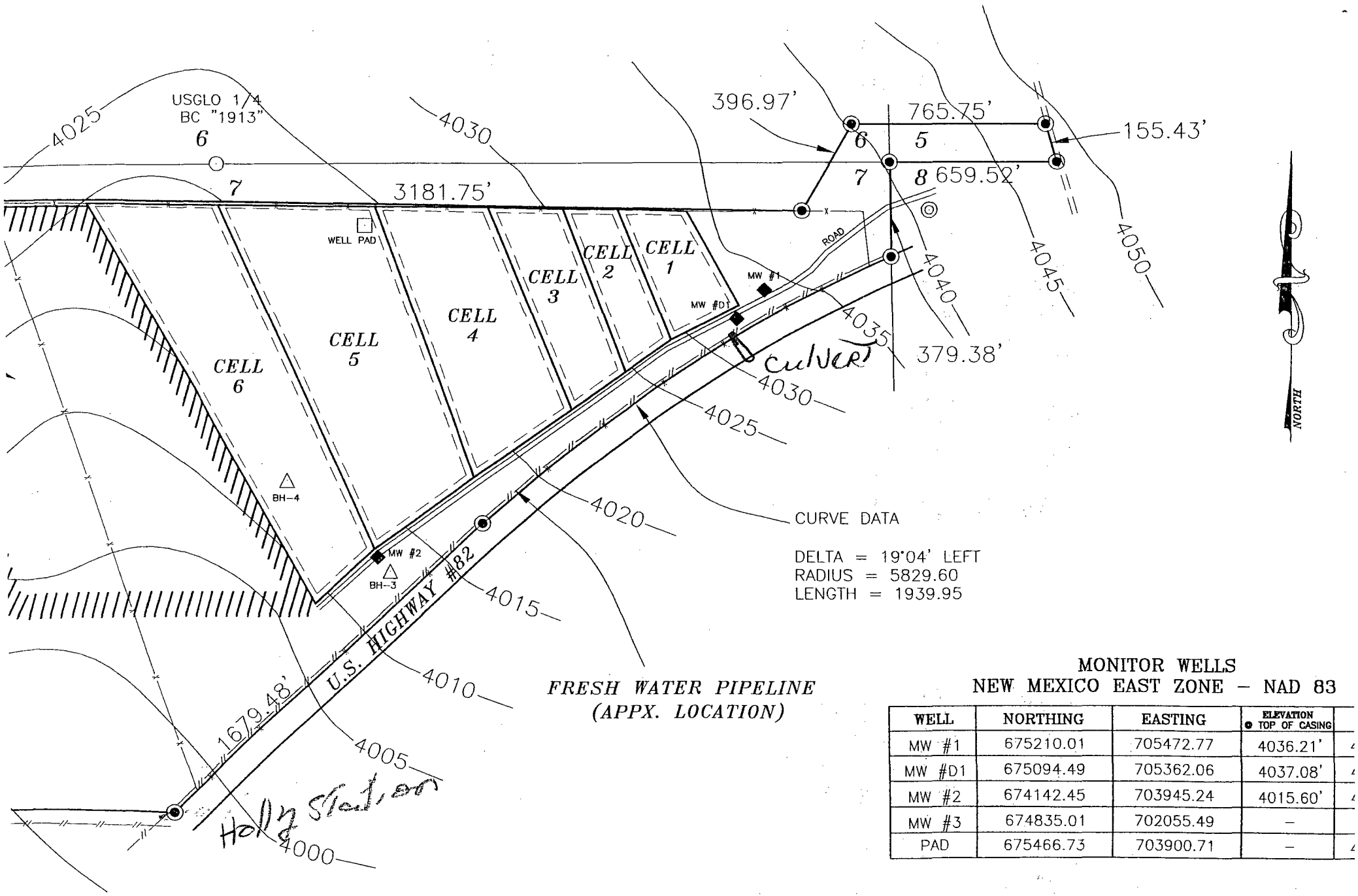
Survey Date: 08/08/2007	W.O. Number: 070808MW-REV.C
	File: 070808MW-REV.C.DWG
Date: 01/29/2008	Drafted By: KA



Distance Berm to Holly: 0.5 Mile

Distance Berm to MW-2 area: 0.3 Mile

7, TOWNSHIP 17 SOUTH, RANGE 32 EAST, N.M.P.M.,
LEA COUNTY, NEW MEXICO



CURVE DATA

DELTA = 19°04' LEFT
RADIUS = 5829.60
LENGTH = 1939.95

FRESH WATER PIPELINE
(APPX. LOCATION)

MONITOR WELLS
NEW MEXICO EAST ZONE – NAD 83

WELL	NORTHING	EASTING	ELEVATION @ TOP OF CASING
MW #1	675210.01	705472.77	4036.21'
MW #D1	675094.49	705362.06	4037.08'
MW #2	674142.45	703945.24	4015.60'
MW #3	674835.01	702055.49	–
PAD	675466.73	703900.71	–

DRAFT

Groundwater Investigation Report
Artesia Aeration
Section 7, Township 17S, Range 32E
Lea County, New Mexico

January 2008

Prepared for:

Artesia Aeration
5614 Lovington Highway
Hobbs, NM 88240

By:

Safety & Environmental Solutions, Inc.
703 E. Clinton Suite 102
Hobbs, New Mexico 88240
(505) 397-0510

I. Introduction

The report presents the results of geologic and groundwater investigation at the Artesia Aeration facility, which is located in Section 7, Township 17S, Range 32E, Lea County, New Mexico. The facility location is located on private land approximately two miles west of the unincorporated community of Maljamar and is adjacent to and on the north side of US Highway 82. The location of the facility is shown in Figure 1.

II. Background

Artesia Aeration is an NM Oil Conservation Division (OCD) facility approved for the land farm remediation of hydrocarbon-contaminated soil resulting from current and past spills, leaks or other releases of petroleum hydrocarbon associated with the drilling and production of oil and natural gas. The facility desires to receive for long-term encapsulation salt-contaminated solids and soil resulting from drilling operations and produced water spills and leaks from said operations. The facility is preparing an application for submittal to the OCD for approval to receive such materials. The salt contaminated solids will be placed in lined pits with a maximum depth, including liners, of 25 ft. beneath the land surface. The maximum area within the facility where such proposed pits may be located is shown on Figure 2, the topographic survey, as "Proposed Expansion Area".

As part of the application, Artesia Aeration is providing the OCD with information on the geologic environment and groundwater, or lack thereof, in the vicinity of the proposed pits. Safety and Environmental Solutions, Inc., was engaged to supervise drilling and installation of a monitor wells and including a deep boring whose dual purpose is to provide lithologic information and serve as a monitoring well.

III. Geologic Setting

Lea County is divided approximately in half by an escarpment known as the Mescalero Ridge. This feature is oriented from northwest to southeast. To the east of the escarpment, the landscape is flat or only slightly undulating and is known as the High Plains. The escarpment itself consists of a cliff face capped by a thick layer of caliche known as the Caprock and may be as high as 150 feet. The caprock is the top of the Ogallala formation which is a sedimentary formation of Tertiary geologic age consisting mainly of sand, poorly to well cemented with calcium carbonate (i.e. sandstone), and some silts and clays. Its major feature is the layer of caliche which caps the formation most everywhere.

To the west of the escarpment, the landscape is dominated by irregular topography consisting of sandy alluvium and caliche deposits. This material is of rather recent geologic origin (Quaternary). The Artesia Aeration facility is just over two miles to the southwest of the escarpment and sediments in the immediate area of the facility are likely from erosion of the Ogallala material.

Beneath the Quaternary sediments at a depth of 30 to 50 feet in the area of Artesia Aeration are Triassic age sediments of the Dockum group known informally as the "redbeds." These rocks consist of claystone, mudstone, siltstone and fine-grained sandstones. Coloring may range from light brown to brown to gray depending on the predominant lithology; however, the most frequent is the reddish-brown color of the claystone and mudstone hence the name "redbeds." The borehole at the facility that was drilled to a depth of 160 feet and completed as a monitor well (MW-3) penetrated

approximately 110 feet of redbeds, and the colors and lithologies described above were observed in the core samples.

IV. Groundwater

Except for some locations in southern Lea County, potable groundwater is provided by wells located in the Ogallala formation. However groundwater is generally absent in the area to the west of the Ogallala caprock at Maljamar. The lack of potable groundwater west of the caprock has been documented in several reports by the NM Bureau of Mines and the US Geological Survey (see Section VI, References).

A search of New Mexico State Engineer Office and US Geological Survey records did not locate any water wells within two miles of the facility. The closest well found was located 2.3 miles north in Taylor Draw, an alluvial channel draining south from the escarpment. The depth to water was reported as 45 ft. in 1996. In the vicinity of Maljamar several wells were listed in the 1961 Southern Lea County groundwater report. However, with one exception they are shown as being on the Caprock. The one well in the alluvium was located near the Maljamar post office and had a depth to water of 83 ft. in 1954. The location of this well and the Taylor Draw well are shown on Figure 3. East of Maljamar, on the caprock, water wells are numerous; however these wells are located a distance of four miles or greater from the facility and are not mapped.

V. Site Investigation

In May 1999 a single monitoring well located near the entrance to the property (see Figure 2, the topographic survey, showing the location of that well, MW-D1) was drilled to a depth of 120 ft. and completed open hole with no casing or screen below about 20 ft. The lithology reported in the log to the NM State Engineer Office showed sand to 25 ft., green clay to 40 ft. and red clay, green clay and caliche to total depth. No water was encountered. Recent measurements indicate the hole has caved or bridged at a depth of 76 ft. below the top of casing.

Beginning in 2005 a series of boreholes was drilled on the property some of which were completed as monitor wells (the lithologic/completion logs for these wells are shown in the Appendix). Monitor well MW-1, also located near the entrance, encountered brown clay at 23 ft. and various clay and claystone to a depth of 35 ft. No groundwater was found. The borehole was backfilled to 25 ft. and completed as a monitor well which remains dry.

MW-2 is located at the south end of, and between, cells 5 and 6. The well is adjacent to the Highway 82 bar ditch and shows a thin saturated zone on top of red bed clays that may be due to infiltration from intermittent ponded water in the nearby highway bar ditch. A fresh water line is also present between the well and the highway ROW fence. Water levels and water quality for this well are shown in Tables 1 and 2.

Borehole BH-3 was located south of MW-2 between the well and the water line. It was thought that if a water line leak was responsible for the water seen in MW-2, a boring between the line and MW-2 might detect it. However the boring was dry to total depth of 30 ft. Redbeds were located at a depth of 26 ft. at this location.

At the request of the OCD, a third monitor well was drilled in the northwest area of the facility. Lithology to a depth of 50 ft. was determined using a 5 ft. core barrel inside a hollow stem auger. However, the drilling rig was not able to penetrate more than five feet into the consolidated sedimentary formation which begins about 45 ft. below the land

surface. The logs for the first 50 ft. at the MW-3 location are shown as MW-3-1 and MW-3-3. The lithology above 45 ft. was predominately sand with caliche near the surface. From 45-50 ft. the lithology changed to the type commonly associated with the "redbed," that is fine grained clay, claystones, mudstones and sandstones.

From 50 ft. to a total depth of 160 ft., the lithology was determined using an air rotary drilling rig that equipped with a 5 ft. diamond-tipped coring bit. Because the top lithology was generally loose sand, a 9-7/8 in. pilot hole was drilled to 50 ft and lined with a temporary 6-in. PVC surface casing. Below that, diamond bit cored samples whose length before core refusal varied between 2 and 5 ft. with the average length approximately 4 ft.

The lithology for this portion of the borehole (MW-3-2) was generally redbeds from 45 to 52 ft., a light brown fine-grained, well cemented sandstone between 52 and 108 ft., sandstone mixed with clay, mudstone and claystone to 126 ft., and clay and claystone "redbeds" to 160 ft. A composite of all the logs is shown on MW-3 Composite in the Appendix. The discovery of 56 ft. of light brown cemented sandstone in the borehole was not expected and could indicate that the material is from the Triassic Chinle formation, a component of the Dockum group.

After consultation with the on-site OCD representative, Mr. Brad Jones, the boring was backfilled from 160 ft. to 140 ft with bentonite capped with 1 ft. of sand for a well base. It was completed as a monitor well with a screened interval from 129 to 139 ft. The well has sand opposite the screen to 127 ft., bentonite chips (un-hydrated) to 117.5 ft. and cement grout to the surface. It is completed with an above-grade locking steel protection casing and a concrete pad. Measurements taken on December 13, 15 and 18, 2007 and on January 15, 2008 show no water or moisture in the monitor well.

VI. Conclusions

The following can be concluded as a result of the investigation:

1. A review of State Engineer, US Geological Survey and available groundwater reports show no groundwater wells within two miles of the facility. Groundwater is found further to the east associated with the Ogallala formation.
2. At the facility, shallow unconsolidated alluvial sediments exist from the surface to a depth of 25 to 45 ft. beneath the site. These are mainly sands with caliche present nearer the surface.
3. Beneath these sediments a series of consolidated and semi-consolidated fine-grained sedimentary deposits exist consisting of claystones, mudstones, sandstone and clay. The existence of over 50 ft. of well cemented sandstone was unexpected and could indicate the sediments are part of the Chinle formation, a component of the Dockum group.
4. The investigation determined that no alluvial or deeper groundwater exists at MW-3 to a depth of 160 ft.
5. Previously MW-1 did not detect groundwater when drilled to a depth of 35 ft. and continues to be dry at its completion depth of 25 ft.
6. Boreholes 3 and 4, which were not completed as monitor wells, did not detect groundwater at a depth of 30 ft.
7. Monitor well MW-2 contains groundwater with a current saturated thickness of 2.5 ft. However, the well was completed 5 ft. into the thick gravelly silty-clay zone

at the base of the sand zone. The source of this water is unknown, but maybe related to ponded water in the nearby bar ditch on the north side of the highway. The water level appears to fluctuate depending the amount of precipitation, especially heavier precipitation related to summer thunderstorms. The highest water level (saturated thickness 7.1 ft.) was measured in August of 2005 which the season of the summer monsoon.

8. The lack of groundwater at the facility, except at MW-2 as noted above, demonstrates the suitability for its current and proposed use, especially with the engineering controls (synthetically-lined impoundments) that will be part of facility design.

VII. References

Ash, S.R., 1963. Ground-water conditions in northern Lea County, New Mexico: U.S. Geological Survey, Hydrologic Investigations Atlas, HA-62, 2 plates.

Nicholson, A. Jr., and Clebsch, A. Jr., 1961. Geology and ground-water conditions in southern Lea County, New Mexico: N. Mexico Institute of Mining and Technology, State Bureau of Mines and Mineral Resources Ground Water Report #6, 123 p.

Water well records on file with the Office of the New Mexico State Engineer and the US Geological Survey.

VII. Tables and Figures

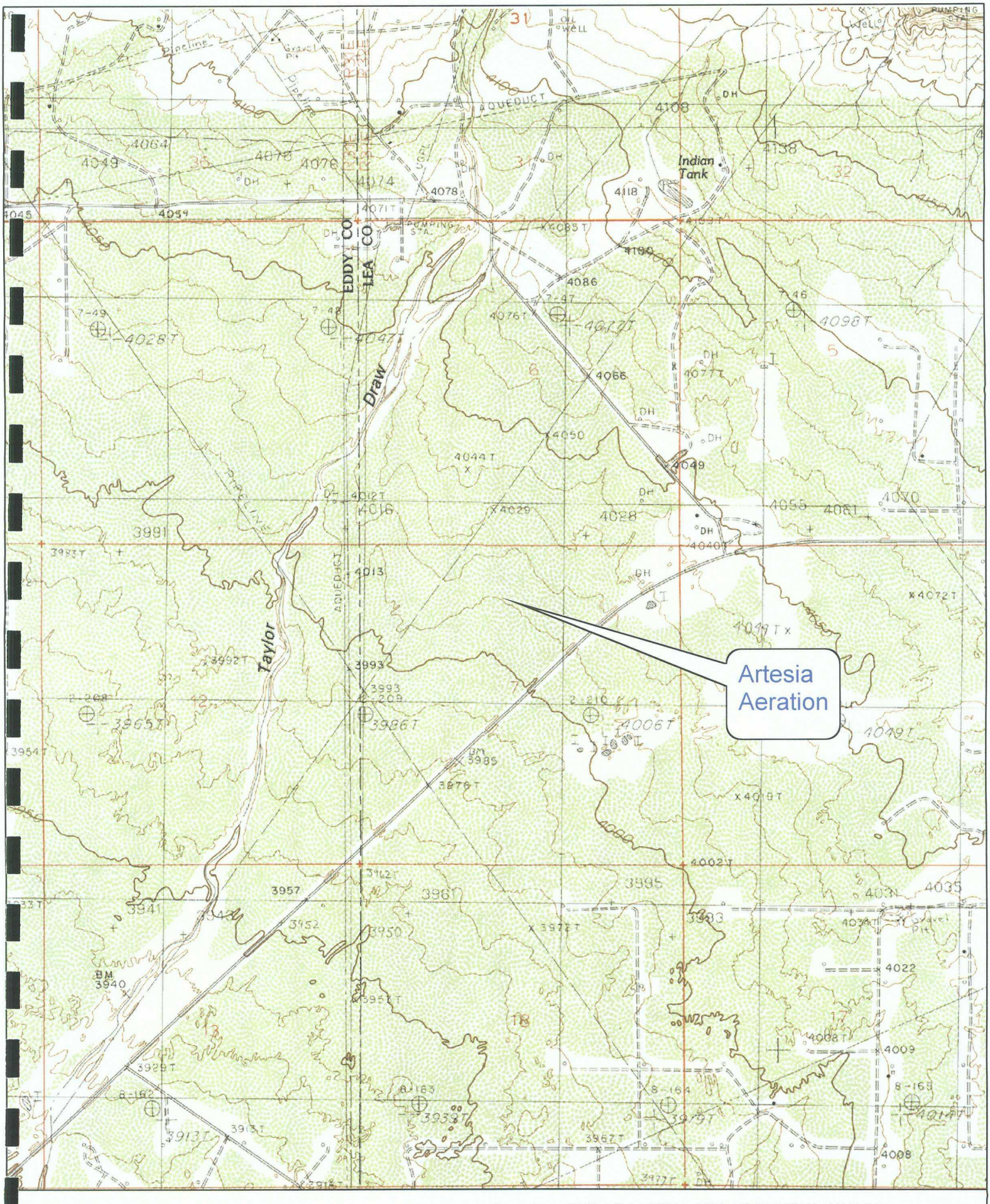
Table 1. Water Level Measurements, Artesia Aeration, Lea County, New Mexico

Monitor Well Name, Total Depth Below TOC (feet)	Elevation Top of Casing (feet)	Ground Level Elevation (feet), Note	Date Measured	Depth to Water Below TOC (feet)	Water Level Elev. (feet)	Water Saturated Thickness (feet)	Water Level Change (ft)
MW-1	4,036.21	4,032.91	05/21/05	Dry	--	--	--
27.81			06/01/05	Dry	--	--	--
			06/03/05	Dry	--	--	--
			06/08/05	Dry	--	--	--
			06/29/05	Dry	--	--	--
			07/12/05	Dry	--	--	--
			07/14/05	Dry	--	--	--
			07/22/05	Dry	--	--	--
			07/26/05	Dry	--	--	--
			08/02/05	Dry	--	--	--
			08/05/05	Dry	--	--	--
			08/09/05	Dry	--	--	--
			12/15/05	Dry	--	--	--
			08/13/07	Dry	--	--	--
			10/26/07	Dry	--	--	--
			01/15/08	Dry	--	--	--
MW-2	4,015.60	4,012.42	05/29/05	24.49	3,991.11	3.6	--
28.06		*	06/01/05	24.59	3,991.01	3.5	-0.10
		*	06/03/05	24.56	3,991.04	3.5	0.03
		*	06/08/05	24.66	3,990.94	3.4	-0.10
		*, 10:30 am	06/29/05	24.97	3,990.63	3.1	-0.31
		*, 3:45 pm	06/29/05	25.24	3,990.36	2.8	-0.27
		*	07/12/05	25.22	3,990.38	2.8	0.02
		*	07/14/05	25.24	3,990.36	2.8	-0.02
		*	07/22/05	25.39	3,990.21	2.7	-0.15
		*	07/26/05	25.43	3,990.17	2.6	-0.04
		*	08/02/05	21.60	3,994.00	6.5	3.83
		*	08/05/05	21.07	3,994.53	7.0	0.53
		*	08/09/05	21.01	3,994.59	7.1	0.06
			12/15/05	23.33	3,992.27	4.7	-2.32
		*	08/13/07	24.35	3,991.25	3.7	-1.02
			10/26/07	25.11	3,990.49	3.0	-0.76
		*	01/15/08	25.58	3,990.02	2.5	-0.47
MW-3	--	4,028.37	12/15/08	Dry	--	--	--
142.15			12/18/07	Dry	--	--	--
142.9			01/15/08	Dry	--	--	--
MW-D1	4,037.08	4,032.40	05/13/99	Dry	--	--	--
124.68			05/21/05	Dry	--	--	--
			08/13/07	Dry - unable to determine total depth			--
76.03			10/26/07	Dry	--	--	--
			01/15/08	Dry	--	--	--
Locations surveyed 08/08/07							
* - Pumped dry after measurement							

Table 2. Water Quality Results, Artesia Aeration, Lea County, New Mexico

Monitoring Well	Sample Date	Chloride (mg/L)	Total Dissolved Solids (mg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Xylenes (total, µg/L)
MW-2	05/29/05	364	1,263	- -	- -	- -	- -
	08/13/07	1,500	4,600	0.5	0.5	0.5	<1.0
	01/15/08	980	3,700	0.5	0.5	0.5	<1.0
NM Groundwater Standard[1]:		**250**	**1,000**	**10.0**	**750**	**750**	**620**
Notes: 1.	Water Quality Control Commission Standards adopted by the NM Oil Conservation Division						
2005 analysis performed at Cardinal Laboratories, Hobbs, NM using EPA SW-846 method 160.1 (TDS),							
	and Standard Method 4500-Cl B (Cl)						
2008 Analyses by Argon Laboratories, Hobbs, NM using EPA SW-846 methods 8021B (GC volatile organics),							
	160.1 (TDS) and 300.0 (Cl).						

Figure 1. Location Map, Artesia Aeration, Lea County, New Mexico



Name: MALJAMAR
Date: 1/29/2008
Scale: 1 inch equals 2000 feet

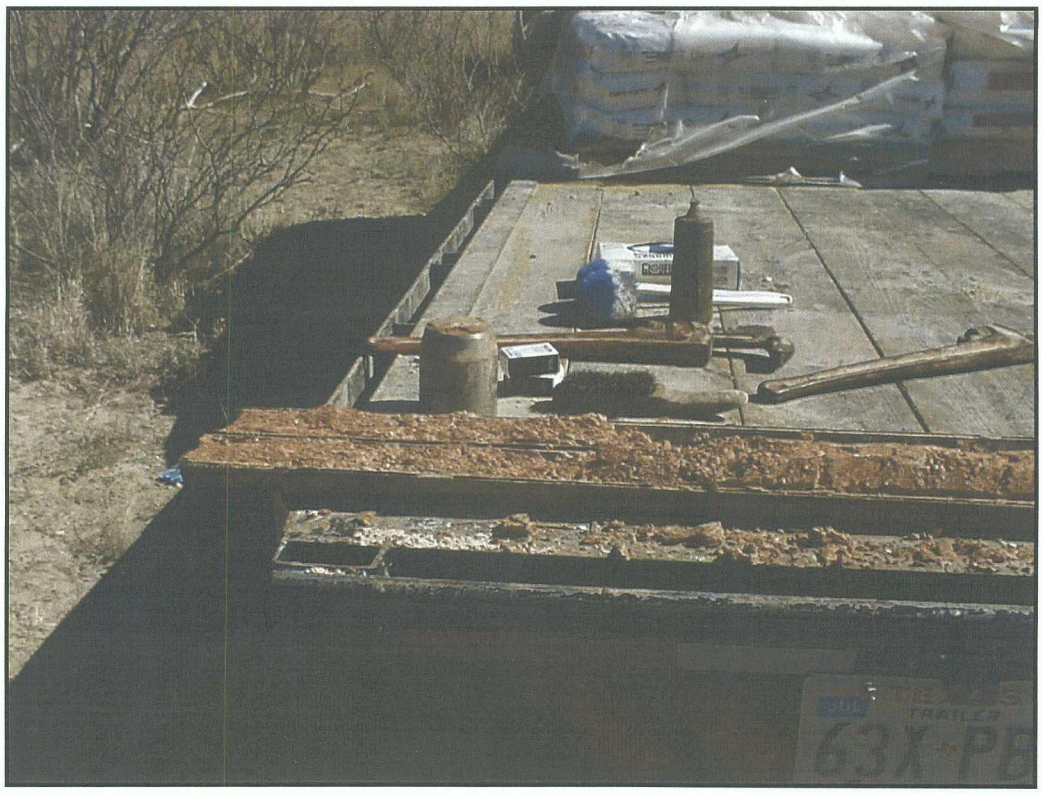
Location: 032° 51' 14.23" N 103° 48' 26.25" W NAD 83
Caption: Figure 1. Location Map, Artesia Aeration, Lea County, New Mexico

Figure 2. Topographic Survey, Artesia Aeration
Lea County, New Mexico

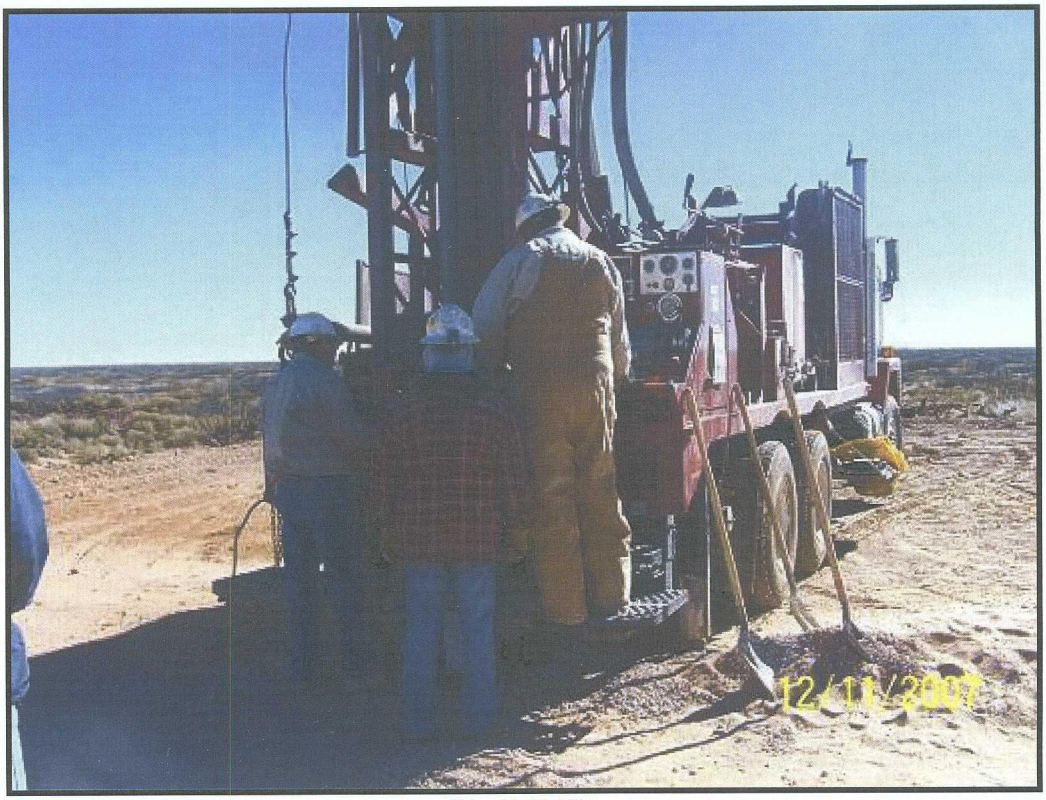
Name: MALJAMAR
Date: 1/29/2008
Scale: 1 inch equals 4000 feet

Location: 032° 51' 14.23" N 103° 48' 26.25" W NAD 83
Caption: Figure 3. Location of nearby water wells, Artesia Aeration. Ring interval 0.5 miles

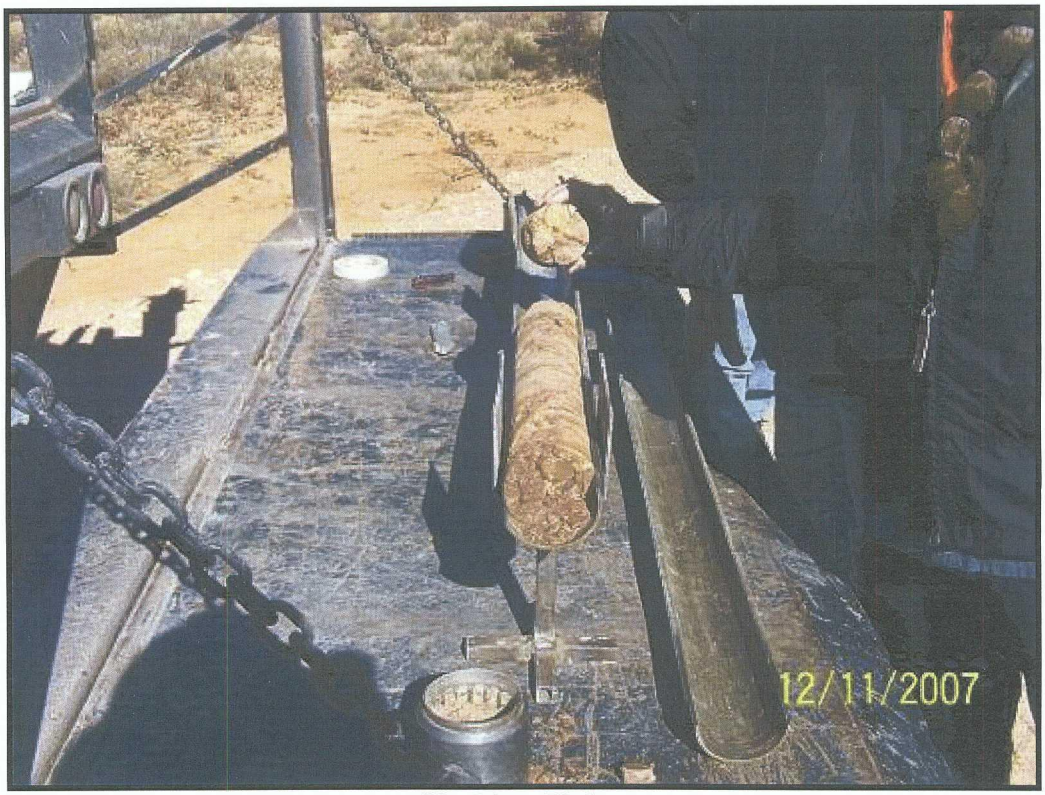
VIII. Appendix - Supporting Information



Example of five-foot core barrel sampling method (from an unrelated location)



#1- Drill Rig



#2- 51 to 53 feet

#3- 53 to 56 feet

#4- 56 to 58 feet

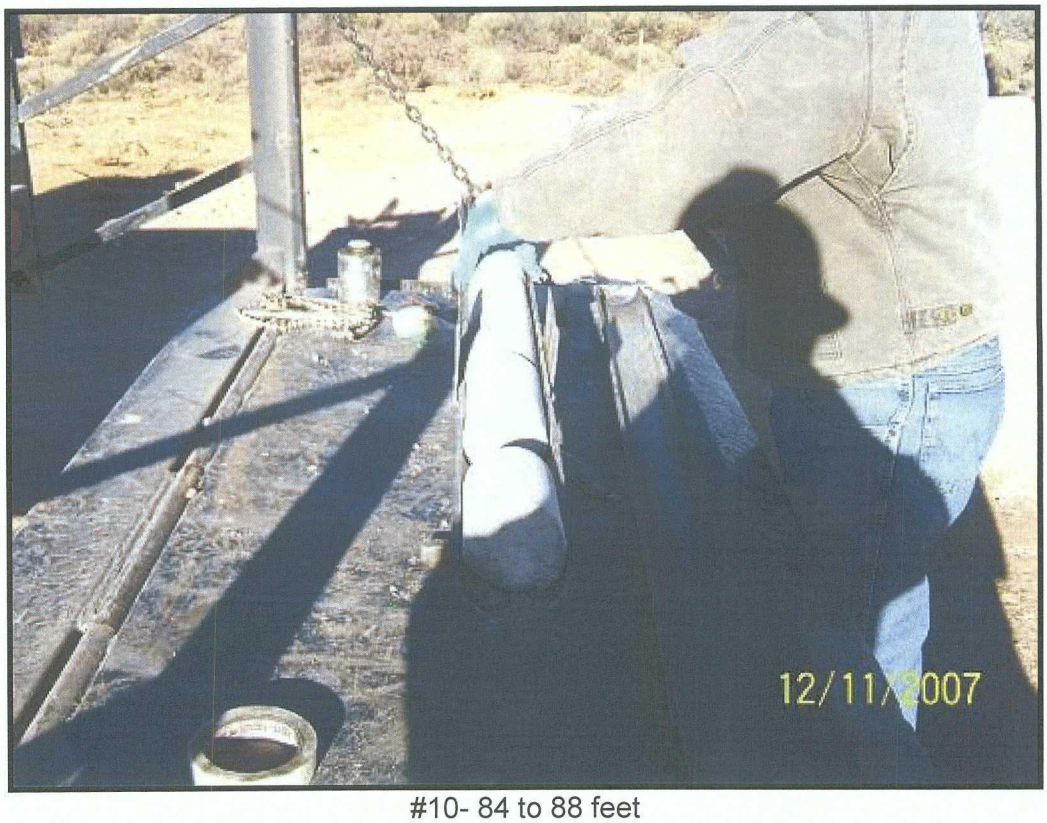
#5- 59 to 64 feet

#6- 64 to 69 feet

#7- 69 to 74 feet

#8- 74 to 79 feet

#9- 79 to 84 feet



#10- 84 to 88 feet

#11- 88 to 93 feet

#12- 93 to 98 feet

#13- 98 to 101 feet

#14- 101 to 105 feet

#15- 105 to 109 feet

#16- 109 to 113 feet

#17- 113 to 117 feet

#18- 117 to 121 feet

#19- 121 to 125 feet

#20- 125 to 130 feet

#21- 130 to 135 feet

#22a- 138 to 142 feet. No break in core samples. Adjusted interval based on measured depth of borehole.

#22b- 138 to 142 feet

#23- 142 to 145 feet

#24- 145 to 150 feet

#25- 150 to 155 feet

#26- 155 to 160 feet

Safety & Environmental Solutions, Inc.

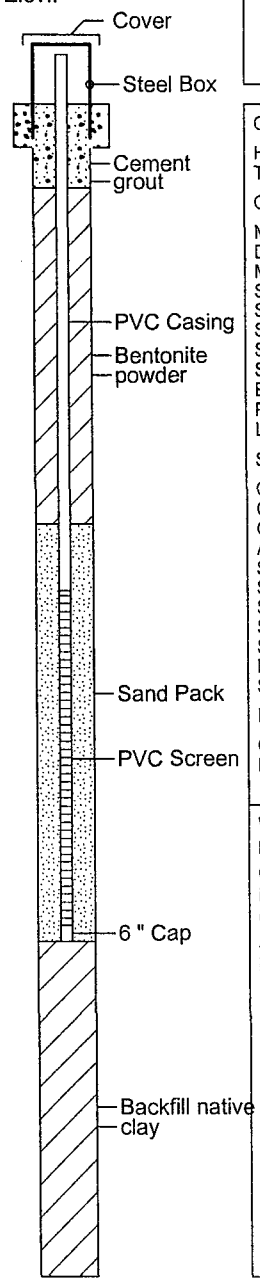
LOG OF WELL MW-1

Groundwater Investigation
Artesia Aeration
Maljamar, New Mexico
N1/2, Section 7, T17S, R32E

Date, Time Started:	: 05/14/05; 0900	Drilled By:	: Eco/Enviro Drilling
Date, Time Completed	: 05/14/05; 1430	Logged By:	: D.G. Boyer, SESI
Hole Diameter:	: 8 1/4"	Northing Coordinate	:
Drilling Method:	: Hollow Stem Auger	Easting Coordinate	:
Drilling Equipment:	: Foremost-Mobile B-57	Survey By	:

Sample Type:
SS Split Spoon (18 in. or 24 in.)
CB Core Barrel (5 ft.)
CT Auger Cuttings
NR No recovery

Depth in Feet	Sample Type	Recovery (ft.)	USCS	GRAPHIC	DESCRIPTION
0	CT		SP		0-4 ft. SAND, poorly graded (uniform), light brown, fine grained, dry
5			CA		4-6 ft. CALICHE, white (chalk color), dry
	CT		SP		6-10 ft. SAND, poorly graded (uniform), light brown, fine grained, frequent small caliche gravels/fragments to 1/4", dry
10					9-10 ft. Increasing caliche gravels and silt
	CT		ML		10-15 ft. SANDY SILT, very light brown, with occasional caliche gravel, very dry
15	CT		SP		15-20 ft. SILTY SAND, light reddish brown, very fine grained, dry
20	CB	1.9			20-23 ft. SAND, reddish-brown, very fine grained, dry
			CL		23-25 ft. CLAY, brown, very stiff, dry, very plastic when wetted
25	CB				25-27 ft. CLAY, brown, very stiff, dry
			CL/MS		27-30 ft. CLAY, green, some platey structure (claystone or mudstone), very fine crystals (calcite?), dry
30	CB	1.8			30-33 ft. CLAY, brown and yellow, dry, crumbly 33-34 ft. CLAY and claystone (mudstone), greenish gray, platey, crumbly, dry 34-35 ft. CLAY, grayish grading to brown at base, crumbly, dry
35					



Well Construction Information

COMPLETION DATA

Hole Depth	: 35 ft. Below LS
TD Inside casing	: 27.5 ft. Below TOC

CASING, SCREEN & CAP

Material, joints	: PVC, threaded
Diameter	: 2 in. ID
Manufacturer	: LAIBE
Screen type	: Slotted
Screen length	: 10 ft.
Screen opening	: 0.020 slot
Scrn. placement	: 15-25 ft. BLS
Sump	: None
Bottom Cap	: 0.5 ft PVC
Protector Casing	: Steel box
Lock Key #	: - -

SEALS & SAND PACK

Cement seal type	: QuikCrete
Cem't placement	: 0 - ~2.5 ft. BLS
Grout placement	: - -
Annular seal type	: Aquagel bentonite
Seal volume	: 4 bg powder, hydrated
Seal placement	: 2.5-12.5 ft. BLS
Sand pack type	: 8/16 Oglebay silica
Sand volume	: 6 bags
Sand placement	: 12.5-25 ft. BLS
Lower Annular seal	: Native clay (backfill)
Seal placement	: 25-35 BLS

ELEVATIONS

Ground elevation	: Approx. 4035 ft.
Inner casing, top	: - -

WELL INSTALLATION:
Drilled to 35 feet with 8 1/4" auger to determine lithology. Backfilled to 25 ft. and installed well with 10 ft. screen. 6 bags 8/16 Oglebay-Norton sand to 12.5 ft., 4 bags Aquagel bentonite powder to 2.5 ft., hydrated. QuikCrete cement mix to surface. Installed locking steel protection casing, stick-up approximatel 2.5 ft.

WELL DEVELOPMENT:
None - well dry, 5/14/05

Notes:
Monitor well dry upon completion.
Location approximately 15 ft. north of service road between entrance and landfarm Cell 1.

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Safety & Environmental Solutions, Inc.

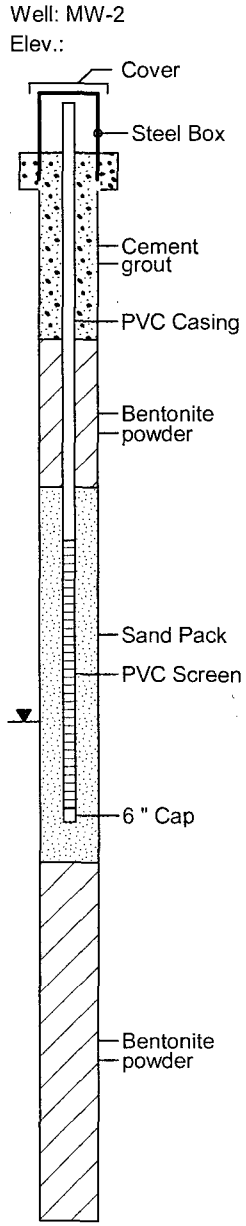
LOG OF WELL MW-2

Groundwater Investigation
Artesia Aeration
Maljamar, New Mexico
N1/2, Section 7, T17S, R32E

Date, Time Started:	: 05/27/05; 1130	Drilled By:	: Eco/Enviro Drilling
Date, Time Completed	: 05/27/05; 1700	Logged By:	: D.G. Boyer, SESI
Hole Diameter:	: 8 1/4"	Northing Coordinate	:
Drilling Method:	: Hollow Stem Auger	Easting Coordinate	:
Drilling Equipment:	: Foremost-Mobile B-57	Survey By	:

Sample Type:
SS Split Spoon (18 in. or 24 in.)
CB Core Barrel (5 ft.)
CT Auger Cuttings
NR No recovery

Depth in Feet	Sample Type	Recovery (ft.)	USCS	GRAPHIC	DESCRIPTION
0	CT		SP		0-5 ft. SAND, reddish brown, fine grained, uniform, dry
5	CT		SP		5-10 ft. SAND, brown to reddish brown, very fine to fine grained, slightly damp, caliche fragments to 1/2 in. at base
10	CT		SP		10-12 ft. SAND, brown to reddish brown, very fine to fine grained
	CT		SP/GP		12-14 ft. GRAVELLY SAND, sand brown, fine grained, with granitic gravels to 1.5 in. Large gravels angular, smaller gravels rounded, quartz common in gravels
15	CT		SP		14-15 ft. SAND, as above
	CT		SC		15-20 ft. CLAYEY SAND, grading to sandy clay at 20 ft. Possible contact with redbeds.
20	CB	2	CL		20-25 ft. GRAVELLY SILTY CLAY/ GRAVELLY SANDY CLAY, reddish brown, with very hard caliche in tip, gravels are caliche gravels.
25	CB	5	CL		25-28.5 ft. CLAY, reddish brown, very dry (redbed) 28.5-29 ft. CLAY, green-gray-brown striations, very dry
30	CB	5	CL/CS		29-31 ft. CLAY and CLAYSTONE, clay brown, claystone dark brown, partially consolidated, poorly cemented, very dry
	CB	5	CL		
	CB	5	MS		31-33.1 ft. CLAY, reddish brown, stiff, very dry, powdery when broken
35	CB	5	CL/CS		33.1-35 ft. CLAYSTONE, dark brown, poorly consolidated, poorly cemented, dry
	CB	5	CS		35-35.9 ft. CLAY and CLAYSTONE, reddish-brown, very dry
40					36.9-40 ft. CLAYSTONE, dark brown, poorly cemented, occasional green inclusions (pea size), occasional caliche streak, very dry.



Well Construction Information

COMPLETION DATA

Hole Depth	: 40 ft. Below LS
TD Inside casing	: 28.29 ft. Below TOC

CASING, SCREEN & CAP

Material, joints	: PVC, threaded
Diameter	: 2 in. ID
Manufacturer	: LAIBE
Screen type	: Slotted
Screen length	: 10 ft.
Screen opening	: 0.020 slot
Scrn. placement	: 15-25 ft. BLS
Sump	: None
Bottom Cap	: 0.5 ft PVC
Protector Casing	: Above grade steel
Lock Key #	: - -

SEALS & SAND PACK

Cement seal type	: QuikCrete
Cem't placement	: 0 - 7 ft. BLS
Grout placement	: - -
Annular seal type	: Aquagel bentonite
Seal volume	: 3 bg powder, hydrated
Seal placement	: 7-12.5 ft. BLS
Sand pack type	: 8/16 Oglebay silica
Sand volume	: 9 bags
Sand placement	: 12.5-25 ft. BLS
Lower Annular seal	: 5 bg powder, hydrated
Seal placement	: 26.5-40 BLS

ELEVATIONS

Ground elevation	: Approx. 4035 ft.
Inner casing, top	: - -

WELL INSTALLATION:
Drilled to 40 feet with 8 1/4" auger to determine lithology. Backfilled to 25 ft. and installed well with 10 ft. screen. 5 bags bentonite powder to 26.5 ft., 1.5 bags 8/16 Oglebay-Norton sand to 25 ft., 7.5 bags to 12.5 ft, 3 bags Aquagel bentonite powder to 7 ft., hydrated. QuikCrete cement mix to surface. Installed locking steel protection casing, stick-up approximatel 3.2 ft. above land surface. Water at 24.86 BTC.

WELL DEVELOPMENT:
On 05/29/05 measured DTW at 24.49 ft. BTC. Pumped out approximately 2.5 gallons and collected water sample.

On 06/03/05 measured water at 24.56 ft. and pumped 1.5 gallon until dry.

Notes:
Location south side of service road opposite SE corner of landfarm Cell 6.

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Safety & Environmental Solutions, Inc.

LOG OF BORING BH-3

Groundwater Investigation
Artesia Aeration
Maljamar, New Mexico
N1/2, Section 7, T17S, R32E

Date, Time Started:	: 06/29/05; 1100	Drilled By:	: Eco/Enviro Drilling
Date, Time Completed	: 06/29/05; - -	Logged By:	: D.G. Boyer, SESI
Hole Diameter:	: 8 1/4"	Northing Coordinate	:
Drilling Method:	: Hollow Stem Auger	Easting Coordinate	:
Drilling Equipment:	: Foremost-Mobile B-57	Survey By	:

Sample Type:
SS Split Spoon (18 in. or 24 in.)
CB Core Barrel (5 ft.)
CT Auger Cuttings
NR No recovery

Depth in Feet	Sample Type	Recovery (ft.)	USCS	GRAPHIC	DESCRIPTION
0	CB	1.4	SP		0-5 ft. SAND, reddish brown, very fine grained, approx. 1 in. caliche and sand at 5 ft., chalk color
5					5-5.8 ft. SAND, reddish brown, very fine grained
			CA		5.8-7 ft. CALICHE, chalk-color with brown inclusions, soft
	CB	5	SP		7-10 ft. SAND with caliche fragments, chalk color, very fine grained, soft caliche, dry
10					10-10.5 ft. SAND, very light brown, with sandstone "cookies"
			SW		10.5-12 ft. GRAVELLY SAND, sand very light brown, very fine to fine grained, gravels are granitic to 3/4 in.
	CB	3.8	SP		12-13.5 ft. SAND, brown, very fine grained, granitic gravels at 13.5 ft.
			SS		13.5-13.7 ft. SANDSTONE, poorly cemented, dry
15			SS/SL		15-17.3 ft. SANDSTONE/SILTSTONE, poorly consolidated and poorly cemented.
	CB	2.7	SP		17.3-17.5 ft. SAND, light brown, very fine grained, dry
20	CB	NR	- -		20-25 ft. No recovery, nothing in core or on tip, dry core barrel
25			SS/SL		25-26 ft. SANDSTONE/SILTSTONE, light brown, very fine grained, hard.
	CB	3.7	CL		26-28.7 ft. Red-bed CLAY, reddish-brown, very stiff, very dry
30					

Notes:
Location 65 ft. south of MW-2 between MW-2 and water pipeline. Backfilled with 10 bags 3/8 in. Holeplug bentonite chips, hydrated.

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Safety & Environmental Solutions, Inc.

LOG OF BORING BH-4

(Page 1 of 1)

Groundwater Investigation
Artesia Aeration
Maljamar, New Mexico
N1/2, Section 7, T17S, R32E

Date, Time Started:	: 06/29/05; - -	Drilled By:	: Eco/Enviro Drilling
Date, Time Completed	: 06/29/05; 1630	Logged By:	: D.G. Boyer, SESI
Hole Diameter:	: 8 1/4"	Northing Coordinate	:
Drilling Method:	: Hollow Stem Auger	Easting Coordinate	:
Drilling Equipment:	: Foremost-Mobile B-57	Survey By	:

Sample Type:
SS Split Spoon (18 in. or 24 in.)
CB Core Barrel (5 ft.)
CT Auger Cuttings
NR No recovery

Depth in Feet	Sample Type	Recovery (ft.)	USCS	GRAPHIC	DESCRIPTION
0	CB	2	AR		0-1.7 Fill material (rock, sand), damp
			SP		1.7-2 ft. SAND, brown, very fine to fine grained, damp
5	CB	5	SC		5-5.4 ft. CLAYEY SAND, reddish-brown, slightly damp
			CA/CL		5.4-6.6 ft. CALICHE (soft), chalk color and sandy clay, brown
			CA		6.6-8.0 ft. CALICHE, sandy (or caliche sand) soft, very light brown,
			SP		8.0-10.0 ft. SAND, limey sand grading to brown sand, very fine grained, dry core
10	CB	3.8			10-12.6 ft. SAND, brown, very fine grained
					12.6-13.8 ft. SAND, limey, chalk white, very fine grained, silty, powdery in spots, Hard chert/sandstone rock at base (15 ft.), dry core
15	CB	2.2			15-16.2 ft. SAND, very light brown, very fine grained, limey, dry
			SP/SS		16.2 ft. SANDSTONE rock at 16.2 ft., hard, well cemented 16.2-17.2 ft. SAND and SANDSTONE, sand limey, very fine grained, sandstone consolidated but poorly cemented, dry
20	CB	4.2	SS/SP		20-21.9 ft. SANDSTONE and SAND, sandstone poorly consolidated, medium cementing; sand brown, very fine grained, dry
			CL		21.9-24.2 ft. Redbed CLAY, brown, very stiff, very dry
25	CB	3.2	CL		25-28.2 ft. SANDY CLAY with some clayey sand, redbeds, hard, competent sandstone, rock in tip, dry.
30					

Notes:
Located in southern 1/3 center of Cell 6. Backfilled with 13 bags 3/8 in. Holeplug bentonite chips, hydrated.

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Safety & Environmental Solutions, Inc.

LOG OF BORING MW-3-1

Groundwater Investigation
Artesia Aeration
Maljamar, New Mexico
N1/2, Section 7, T17S, R32E

Date, Time Started:	: 10/30/07; 0930	Drilled By:	: Eco/Enviro Drilling
Date, Time Completed	: 10/30/07; 1600	Logged By:	: D.G. Boyer, P.G., SESI
Hole Diameter:	: 8 1/4"	Northing Coordinate	:
Drilling Method:	: Hollow Stem Auger	Easting Coordinate	:
Drilling Equipment:	: Foremost-Mobile B-57	Survey By	:

Sample Type:
RC Rock Coring Bit
CB Core Barrel (5 ft.)
CT Auger Cuttings
NR No recovery

Depth in Feet	Sample Method	Recovery (ft.)	USCS	GRAPHIC	DESCRIPTION
0			SP		0-1.0 ft. SAND, reddish-brown, fine grained, blow sand, dry
	CB	1.2	GP/SP		1-1.2 ft. CALICHE GRAVEL and limey SAND, gravel to 3/4", white
5	CB	0.5	CA/SP		5-10 ft. Caliche rock in bit; cuttings are very fine to fine grained sand with caliche
10	CB	1.5			10-12.5 ft. CALICHE and SAND, very light brown, very fine grained, with granitic pea-sized pebbles mainly from 11-11.5 ft., dry.
	CB	2.6	SP		12.5-14.5 ft. SAND, light brown, fine grained, occasional caliche gravel to 3/4 - 1 in., sand lightly cemented in places.
15			CA		14.5-15 ft. CALICHE, rock in core tip, very light brown, well cemented, dry
	CB	2.2	GW		15-17.5 ft. SANDY GRAVEL, gravel sizes pea to 2 in., smaller are granitic, larger are caliche, hard limestone with silica; sand light to very light brown, very fine to fine grained, some silt, dry
	CB	2.2			17.5-18 ft. SANDY GRAVEL, as above
			SP		18-19.1 ft. SAND, brown, very fine to fine grained, uniform, occasional caliche rock
			SS		19.1-19.7 ft. SANDSTONE, very light brown, soft, very poorly cemented, dry
20	CB	2.2	SP		20-21.8 ft. SAND, brown, very fine to fine grained, uniform, clean, dry
					21.8-22.2 ft. SAND, limey, very light brown to creme color, very fine grained, dry
					22.2-22.9 ft. SAND, limey, with small gravels
	CB	2.5			22.9-25.0 ft. SAND, light brown, very fine to fine grained, uniform, dry
25					

Notes:
Drillers could not drill deeper than 50 ft. without adding H2O to move cuttings up auger.
Onsite 10/31/07, 0800, measured hole, total depth 44 ft. BLS, dry, no water, plugged top 3 ft. with wooden plug.
Onsite 12/11/07, uncovered plug and measured hole, caved/bridged to 9.5 ft. BLS, dry, plugged back to surface with 12 bags HolePlug bentonite, hydrated.

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Safety & Environmental Solutions, Inc.

LOG OF BORING MW-3-1

Groundwater Investigation
Artesia Aeration
Maljamar, New Mexico
N1/2, Section 7, T17S, R32E

Date, Time Started:	: 10/30/07; 0930	Drilled By:	: Eco/Enviro Drilling
Date, Time Completed	: 10/30/07; 1600	Logged By:	: D.G. Boyer, P.G., SESI
Hole Diameter:	: 8 1/4"	Northing Coordinate	:
Drilling Method:	: Hollow Stem Auger	Easting Coordinate	:
Drilling Equipment:	: Foremost-Mobile B-57	Survey By	:

Sample Type:
RC Rock Coring Bit
CB Core Barrel (5 ft.)
CT Auger Cuttings
NR No recovery

Depth in Feet	Sample Method	Recovery (ft.)	USCS	GRAPHIC	DESCRIPTION
25	CB	2.2	SP		25-27 ft. SAND, light brown, very fine grained, dry, compacted
					27-27.2 ft. SAND, limey, very light brown, dry, compacted with weak cement
	CB	2.3	SP/SS		27.5-30 ft. SAND, very fine grained, and SANDSTONE, limey, very light brown, very fine grained, poorly cemented, very limey from 29.5-29.8 ft.
30	CB	2.3			30-32.5 ft. SAND, light brown, very fine to fine grained, and occasional SANDSTONE, very fine grained, very poorly cemented, dry
	CB	2.6			32.5-35 ft. SAND, light brown, very fine to fine grained, occasional limey SANDSTONE, very poorly cemented, dry
35	CB	2.2			35-37.5 ft. SAND, light brown, very fine to fine grained, occasional SANDSTONE lens < 1/2 ft. thick, poorly cemented, dry
	CB	2.2			37.5-40 ft. SAND, light brown, fine grained, and occasional SANDSTONE lens < 1/2 ft. thick, soft, poorly cemented, dry
40	CB	2.4	SP		40-41.3 ft. SAND, light brown, very fine to fine grained, dry
					41.3-42.4 ft. SAND, *reddish-brown, fine grained, dry*
	CB	2.6	SS		42.5-43.6 ft. Silty, clayey SANDSTONE, reddish-brown, some very fine grained sand, variable cementing
					43.6-45.1 ft. SANDSTONE, reddish-brown, very fine to fine grained, at base silty clay and siltstone, dry
45	CB	2.2	CL/CS		45-47.5 ft. "Redbed", CLAY, CLAYSTONE, MUDSTONE, some sand, brown to reddish-brown, generally consolidated, hard, dry
	CB	2.2	SS/CS		47.5-50 ft. "Redbed", SANDSTONE, CLAYSTONE, reddish-brown, soft, friable but generally consolidated, dry
50					

Notes:
Drillers could not drill deeper than 50 ft. without adding H2O to move cuttings up auger.
Onsite 10/31/07, 0800, measured hole, total depth 44 ft. BLS, dry, no water, plugged top 3 ft. with wooden plug.
Onsite 12/11/07, uncovered plug and measured hole, caved/bridged to 9.5 ft. BLS, dry, plugged back to surface with 12 bags HolePlug bentonite, hydrated.

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Safety & Environmental Solutions, Inc.

LOG OF BORING MW-3-2

Groundwater Investigation
Artesia Aeration
Maljamar, New Mexico
N1/2, Section 7, T17S, R32E

Date, Time Started:	: 12/11/07; 0900	Drilled By:	: Harrison-Cooper, Lubbock
Date, Time Completed	: 12/13/07; 1200	Logged By:	: D.G. Boyer, P.G., SESI
Hole Diameter:	: 9-7/8" pilot, 5-1/2" coring	Northing Coordinate	:
Drilling Method:	: Diamond coring bit	Easting Coordinate	:
Drilling Equipment:	: Ingersoll-Rand TH-60	Survey By	:

Sample Type:
RC Rock Coring Bit
CB Core Barrel (5 ft.)
CT Auger Cuttings
NR No recovery

Depth in Feet	Sample Method	Recovery (ft.)	USCS	GRAPHIC	DESCRIPTION
50	CT		SP/CA		0-50.7 ft. Drill to 50.8 ft with air, set ____ diameter PVC suface casing to prevent caving of sands. Cuttings are sand, caliche gravels and limestone fragments
	RC	2.0	SL/MS		50.7-52.7 ft. "Redbeds", SILTSTONE, CLAYSTONE, MUDSTONE, CLAY, variable color, light yellowish-brown to reddish-brown, friable, dry
55	RC	3.5	SS/SL		52.7-56.2 ft. SANDSTONE, light brown, very fine grained, friable, well cemented, with some reddish-brown, SILTSTONE
	RC	1.9	SS		56.2-56.7 ft. SANDSTONE, very light brown, silty, well cemented, condensation moisture
			SL		56.7-58.1 ft. SANDY SILTSTONE, light brown to reddish-brown, dry
60	RC	5.0			58.7-63.7 ft. SANDSTONE, light brown, well cemented, with thin siltstone/mudstone lenses at 60.5 and 61.1 ft.
65	RC	5.0	SS		63.7-68.7 ft. SANDSTONE, light brown, very fine grained, hard, well cemented
70	RC	5.0			68.7-73.7 ft. SANDSTONE, very light brown, very fine grained, hard, well cemented
75	RC	5.0			73.7-76.2 ft. SANDSTONE, very light brown, very fine grained, hard, well cemented, dry
			CS		76.2-76.3 ft. CLAYSTONE
			SS		76.3-78.7 ft. SANDSTONE
80					

Notes:
Harrison-Cooper drillers moved 30 ft. NNE of original location, drilled to 50.7 ft. and set 6-in. ID PVC surface casing with top of casing 1.0 ft above land *surface. Coring hole is 5-1/2 in., retrieved core diameter 3 in.*
See MW-3 well completion log for monitor well installation details

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Safety & Environmental Solutions, Inc.

LOG OF BORING MW-3-2

Groundwater Investigation
Artesia Aeration
Maljamar, New Mexico
N1/2, Section 7, T17S, R32E

Date, Time Started:	: 12/11/07; 0900	Drilled By:	: Harrison-Cooper, Lubbock
Date, Time Completed	: 12/13/07; 1200	Logged By:	: D.G. Boyer, P.G., SESI
Hole Diameter:	: 9-7/8" pilot, 5-1/2" coring	Northing Coordinate	:
Drilling Method:	: Diamond coring bit	Easting Coordinate	:
Drilling Equipment:	: Ingersoll-Rand TH-60	Survey By	:

Sample Type:
RC Rock Coring Bit
CB Core Barrel (5 ft.)
CT Auger Cuttings
NR No recovery

Depth in Feet	Sample Method	Recovery (ft.)	USCS	GRAPHIC	DESCRIPTION
80	RC	5.0	SS		78.7-83.7 ft. SANDSTONE, very light brown, very fine grained, very hard, very well cemented, dry
85	RC	4.6			83.7-88.3 ft. SANDSTONE, very light brown, very fine grained, very hard, very well cemented, dry
90	RC	4.6			88.3-92.9 ft. SANDSTONE, very light brown, very fine grained, very hard, very well cemented, dry
95	RC	4.6			92.9-97.5 ft. SANDSTONE, very light brown, very fine grained, very hard, very well cemented, dry
100	RC	3.6			97.5-101.1 ft. SANDSTONE, very light brown, very fine grained, very hard, very well cemented, dry
	RC	4.3	SS/CS		101.1-102.2 ft. SANDSTONE, very light brown, very fine grained, very hard, very well cemented, dry 102.2-105.4 ft. SANDSTONE, with embedded brown-black clay/claystone inclusion, hard, dry
105	RC	4.0			105.2-108.9 ft. SANDSTONE, very light brown, very fine grained, very hard, very well cemented, dry, with increasing clay lenses at base. Clay thin, hard, well cemented
110			SS/CS		108.9-109.1 ft. SANDSTONE, yellowish-brown, soft 109.1-109.3 ft. SANDSTONE, with brown CLAY inclusions, well cemented

Notes:
Harrison-Cooper drillers moved 30 ft. NNE of original location, drilled to 50.7 ft. and set 6-in. ID PVC surface casing with top of casing 1.0 ft above land surface. Coring hole is 5-1/2 in., retrieved core diameter 3 in.
See MW-3 well completion log for monitor well installation details

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Safety & Environmental Solutions, Inc.

LOG OF BORING MW-3-2

Groundwater Investigation
Artesia Aeration
Maljamar, New Mexico
N1/2, Section 7, T17S, R32E

Date, Time Started:	: 12/11/07; 0900	Drilled By:	: Harrison-Cooper, Lubbock
Date, Time Completed	: 12/13/07; 1200	Logged By:	: D.G. Boyer, P.G., SESI
Hole Diameter:	: 9-7/8" pilot, 5-1/2" coring	Northing Coordinate	:
Drilling Method:	: Diamond coring bit	Easting Coordinate	:
Drilling Equipment:	: Ingersoll-Rand TH-60	Survey By	:

Sample Type:
RC Rock Coring Bit
CB Core Barrel (5 ft.)
CT Auger Cuttings
NR No recovery

Depth in Feet	Sample Method	Recovery (ft.)	USCS	GRAPHIC	DESCRIPTION
110	RC	4.1	SS/CS		109.3-109.5 ft. SANDSTONE and MUDSTONE, fractured but hard and dry 109.5-110.9 ft. SANDSTONE, with brown CLAY, inclusions, hard, dry 110.9-112.7 ft. SANDSTONE, light brown, very hard 112.7-113.0 ft. CLAY, hard, cemented (in core tip)
115	RC	4.0	SS SS/CL LS SS/CL		113.0-115.1ft. SANDSTONE, light brown, very hard 115.1-115.4 ft. SANDSTONE, with CLAY inclusions 115.4-116.7 ft. LIMESTONE, light gray, with some microcrystals, very hard (wet-likely condensation or water from cleaning core tubes)
120	RC	4.0	SS LS SS SS/CL		116.7-117.0 ft. SANDSTONE and CLAY 117.0-118.0 ft. SANDSTONE, yellowish-brown 118.0-118.1 ft. LIMESTONE, gray 118.1-119.5 ft. SANDSTONE 119.5-121.0 ft. SANDSTONE, CLAY
125	RC	4.4	LS CS LS LS/SS		121-121.5 ft. LIMESTONE, light gray, very hard 121.5-122.3 ft. CLAYSTONE, light brown, mottled, fractures 122.3-123.9 ft. LIMESTONE, light gray, oolitic, fossil inclusions 123.9-125.4 ft. LIMESTONE grading to SANDSTONE, SANDSTONE very light brown, very hard, core dry
130	RC	4.9	SS MS		125.4-125.9 ft. SANDSTONE 125.9-126.7 ft. MUDSTONE, gray, sandstone fragments 126.7-128.9 ft. "Redbeds", CLAY and CLAYSTONE, very hard, cemented, core dry but moist on outer surface only (condensation/wash water, driller cleaning barrel with water, not completly dry going in hole) 129 ft. Fracture zone, moist
135	RC	4.3	CL/CS		129-130.3 ft. CLAY, "redbeds", moisture on core surface 130.3-132.4 ft. CLAY, "redbeds", moisture on core surface 132.4-134.6 ft. CLAYSTONE/MUDSTONE "redbeds", hard, dry
140					137.7-141.7 ft. CLAY and CLAYSTONE, "redbeds", some fractured rock, dry

Notes:
Harrison-Cooper drillers moved 30 ft. NNE of original location, drilled to 50.7 ft. and set 6-in. ID PVC surface casing with top of casing 1.0 ft above land surface. Coring hole is 5-1/2 in., retrieved core diameter 3 in.
See MW-3 well completion log for monitor well installation details

Safety & Environmental Solutions, Inc.

LOG OF BORING MW-3-2

Groundwater Investigation
Artesia Aeration
Maljamar, New Mexico
N1/2, Section 7, T17S, R32E

Date, Time Started:	: 12/11/07; 0900	Drilled By:	: Harrison-Cooper, Lubbock
Date, Time Completed	: 12/13/07; 1200	Logged By:	: D.G. Boyer, P.G., SESI
Hole Diameter:	: 9-7/8" pilot, 5-1/2" coring	Northing Coordinate	:
Drilling Method:	: Diamond coring bit	Easting Coordinate	:
Drilling Equipment:	: Ingersoll-Rand TH-60	Survey By	:

Sample Type:
RC Rock Coring Bit
CB Core Barrel (5 ft.)
CT Auger Cuttings
NR No recovery

Depth in Feet	Sample Method	Recovery (ft.)	USCS	GRAPHIC	DESCRIPTION
140	RC	4.0	CL/CS		141.7-143.3 ft. CLAY and CLAYSTONE, "redbeds", brown
	RC	3.6	CS		143.3-145.3 ft. CLAYSTONE, mottled then gray, hard, dry
145			CL/CS		145.3-146.8 ft. CLAY and CLAYSTONE "redbed", fractured
					146.8-147.1 ft. CLAY and CLAYSTONE "redbed"
	RC	4.6	CL		147.1-147.5 ft. CLAY, gray
					147.5-149.9 ft. CLAY and CLAYSTONE "redbed"
150					149.9-151.2 ft. CLAY and CLAYSTONE "redbed"
	RC	4.7			151.2-152.4 ft. CLAY and CLAYSTONE "redbed"
			CL/CS		152.4-154.6 ft. CLAY and CLAYSTONE "redbed", dry, fractures at 153.4 ft.
155	RC	5.0			154.6-159.6 CLAY and CLAYSTONE "redbed", reddish-brown, fractured in places, dry
160					
165					
170					

Notes:
Harrison-Cooper drillers moved 30 ft. NNE of original location, drilled to 50.7 ft. and set 6-in. ID PVC surface casing with top of casing 1.0 ft above land surface. Coring hole is 5-1/2 in., retrieved core diameter 3 in.
See MW-3 well completion log for monitor well installation details

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Safety & Environmental Solutions, Inc.

LOG OF BORING MW-3-3

Groundwater Investigation
Artesia Aeration
Maljamar, New Mexico
N1/2, Section 7, T17S, R32E

Date, Time Started:	: 12/11/07; 0930	Drilled By:	: Eco/Enviro Drilling
Date, Time Completed	: 12/11/07; 1130	Logged By:	: D.G. Boyer, P.G., SESI
Hole Diameter:	: 8 1/4"	Northing Coordinate	:
Drilling Method:	: Hollow Stem Auger	Easting Coordinate	:
Drilling Equipment:	: Foremost-Mobile B-57	Survey By	:

Sample Type:
RC Rock Coring Bit
CB Core Barrel (5 ft.)
CT Auger Cuttings
NR No recovery

Depth in Feet	Sample Method	Recovery (ft.)	USCS	GRAPHIC	DESCRIPTION
0	CB	1.4	AR		0-1.4 ft. FILL MATERIAL used to construct well pad, caliche with sand, some clay
	CB	2.0	SP		2.5-5 ft. SAND, reddish-brown, very fine grained, some roots, slightly damp
5	CB	2.2			5-6.5 ft. SAND, reddish-brown, very fine grained, slightly damp
	CB	1.6	CA		6.5-7.2 ft. CALICHE, very light brown (creme color), fragments soft to hard 7.5-9.1 ft. CALICHE, light brown (creme color), soft to hard, some fragments to 1.5 in., becoming sandy at 9.1 ft.
10	CB	2.4	CA/SW		10-12.5 ft. CALICHE, sandy, becoming GRAVELLY SAND, sand creme-colored becoming light brown. Caliche and limestone gravels to 1.5 in., very hard
	CB	2.0	SW		12.5-15 ft. GRAVELLY SAND, light brown, caliche/limestone gravels, some small granitic gravels to 1/4 in.
15					
20					
25					

Notes:
Plugged back to surface with 7 bags HolePlug bentonite, hydrated.

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Safety & Environmental Solutions, Inc.

LOG OF BORING MW-3 (Composite)

Groundwater Investigation
Artesia Aeration
Maljamar, New Mexico
N1/2, Section 7, T17S, R32E

Date, Time Started:	: 10/30/07; 0900	Drilled By:	: Harrison-Cooper, Lubbock
Date, Time Completed	: 12/13/07; 1200	Logged By:	: D.G. Boyer, P.G., SESI
Hole Diameter:	: 9-7/8" pilot, 5-1/2" coring	Northing Coordinate	:
Drilling Method:	: Diamond coring bit	Easting Coordinate	:
Drilling Equipment:	: Ingersoll-Rand TH-60	Survey By	:

Sample Type:
RC Rock Coring Bit
CB Core Barrel (5 ft.)
CT Auger Cuttings
NR No recovery

Depth in Feet	Sample Method	Recovery (ft.)	USCS	GRAPHIC	DESCRIPTION
0	CB	1.4	AR		Detailed log copied from borehole MW-3-3. 0-1.4 ft. FILL MATERIAL used to construct well pad, caliche with sand, some clay
	CB	2.0	SP		2.5-5 ft. SAND, reddish-brown, very fine grained, some roots, slightly damp
5	CB	2.2			5-6.5 ft. SAND, reddish-brown, very fine grained, slightly damp
	CB	1.6	CA		6.5-7.2 ft. CALICHE, very light brown (creme color), fragments soft to hard 7.5-9.1 ft. CALICHE, light brown (creme color), soft to hard, some fragments to 1.5 in., becoming sandy at 9.1 ft.
10	CB	2.4	CA/SW		10-12.5 ft. CALICHE, sandy, becoming GRAVELLY SAND, sand creme-colored becoming light brown. Caliche and limestone gravels to 1.5 in., very hard
	CB	2.0	SW		12.5-15 ft. GRAVELLY SAND, light brown, caliche/limestone gravels, some small granitic gravels to 1/4 in.
15	CB	2.2	GW		Detailed log copied from borehole MW-3-1. 15-17.5 ft. SANDY GRAVEL, gravel sizes pea to 2 in., smaller are granitic, larger are caliche, hard limestone with silica; sand light to very light brown, very fine to fine grained, some silt, dry 17.5-18 ft. SANDY GRAVEL, as above
	CB	2.2	SP		18-19.1 ft. SAND, brown, very fine to fine grained, uniform, occasional caliche rock
			SS		19.1-19.7 ft. SANDSTONE, very light brown, soft, very poorly cemented, dry
20	CB	2.2	SP		20-21.8 ft. SAND, brown, very fine to fine grained, uniform, clean, dry 21.8-22.2 ft. SAND, limey, very light brown to creme color, very fine grained, dry 22.2-22.9 ft. SAND, limey, with small gravels
	CB	2.5			22.9-25.0 ft. SAND, light brown, very fine to fine grained, uniform, dry
25					

Notes:
Eco/Enviro Drilling drilled to 50 ft.; could not drill deeper consolidated formation.
Harrison-Cooper drillers moved 30 ft. NNE of original location, drilled to 50.7 ft. and set 6-in. ID PVC surface casing with top of casing 1.0 ft above land surface. Coring hole is 5-1/2 in., retrieved core diameter 3 in.
See MW-3 well completion log for monitor well installation details

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Safety & Environmental Solutions, Inc.

LOG OF BORING MW-3 (Composite)

Groundwater Investigation
Artesia Aeration
Maljamar, New Mexico
N1/2, Section 7, T17S, R32E

Date, Time Started:	: 10/30/07; 0900	Drilled By:	: Harrison-Cooper, Lubbock
Date, Time Completed	: 12/13/07; 1200	Logged By:	: D.G. Boyer, P.G., SESI
Hole Diameter:	: 9-7/8" pilot, 5-1/2" coring	Northing Coordinate	:
Drilling Method:	: Diamond coring bit	Easting Coordinate	:
Drilling Equipment:	: Ingersoll-Rand TH-60	Survey By	:

Sample Type:
RC Rock Coring Bit
CB Core Barrel (5 ft.)
CT Auger Cuttings
NR No recovery

Depth in Feet	Sample Method	Recovery (ft.)	USCS	GRAPHIC	DESCRIPTION
25	CB	2.2	SP		25-27 ft. SAND, light brown, very fine grained, dry, compacted
					27-27.2 ft. SAND, limey, very light brown, dry, compacted with weak cement
	CB	2.3	SP/SS		27.5-30 ft. SAND, very fine grained, and SANDSTONE, limey, very light brown, very fine grained, poorly cemented, very limey from 29.5-29.8 ft.
30	CB	2.3			30-32.5 ft. SAND, light brown, very fine to fine grained, and occasional SANDSTONE, very fine grained, very poorly cemented, dry
	CB	2.6			32.5-35 ft. SAND, light brown, very fine to fine grained, occasional limey SANDSTONE, very poorly cemented, dry
35	CB	2.2			35-37.5 ft. SAND, light brown, very fine to fine grained, occasional SANDSTONE lens < 1/2 ft. thick, poorly cemented, dry
	CB	2.2			37.5-40 ft. SAND, light brown, fine grained, and occasional SANDSTONE lens < 1/2 ft. thick, soft, poorly cemented, dry
40	CB	2.4	SP		40-41.3 ft. SAND, light brown, very fine to fine grained, dry
					41.3-42.4 ft. SAND, reddish-brown, fine grained, dry
	CB	2.6	SS		42.5-43.6 ft. Silty, clayey SANDSTONE, reddish-brown, some very fine grained sand, variable cementing
					43.6-45.1 ft. SANDSTONE, reddish-brown, very fine to fine grained, at base silty clay and siltstone, dry
45	CB	2.2	CL/CS		45-47.5 ft. "Redbed", CLAY, CLAYSTONE, MUDSTONE, some sand, brown to reddish-brown, generally consolidated, hard, dry
	CB	2.2	SS/CS		47.5-50 ft. "Redbed", SANDSTONE, CLAYSTONE, reddish-brown, soft, friable but generally consolidated, dry
50					

Notes:
Eco/Enviro Drilling drilled to 50 ft.; could not drill deeper consolidated formation.
Harrison-Cooper drillers moved 30 ft. NNE of original location, drilled to 50.7 ft. and set 6-in. ID PVC surface casing with top of casing 1.0 ft above land surface. Coring hole is 5-1/2 in., retrieved core diameter 3 in.
See MW-3 well completion log for monitor well installation details

Safety & Environmental Solutions, Inc.

LOG OF BORING MW-3 (Composite)

Groundwater Investigation
Artesia Aeration
Maljamar, New Mexico
N1/2, Section 7, T17S, R32E

Date, Time Started:	: 10/30/07; 0900	Drilled By:	: Harrison-Cooper, Lubbock
Date, Time Completed	: 12/13/07; 1200	Logged By:	: D.G. Boyer, P.G., SESI
Hole Diameter:	: 9-7/8" pilot, 5-1/2" coring	Northing Coordinate	:
Drilling Method:	: Diamond coring bit	Easting Coordinate	:
Drilling Equipment:	: Ingersoll-Rand TH-60	Survey By	:

Sample Type:
RC Rock Coring Bit
CB Core Barrel (5 ft.)
CT Auger Cuttings
NR No recovery

Depth in Feet	Sample Method	Recovery (ft.)	USCS	GRAPHIC	DESCRIPTION
50	CT		SP/CA		Detailed log copied from borehole MW-3-2. 50-50.7 ft. Drill to 50.8 ft with air, set 6-in. ID PVC suface casing to prevent caving of sands. Cuttings are sand, caliche gravels and limestone fragments
	RC	2.0	SL/MS		50.7-52.7 ft. "Redbeds", SILTSTONE, CLAYSTONE, MUDSTONE, CLAY, variable color, light yellowish-brown to reddish-brown, friable, dry
55	RC	3.5	SS/SL		52.7-56.2 ft. SANDSTONE, light brown, very fine grained, friable, well cemented, with some reddish-brown, SILTSTONE
	RC	1.9	SS		56.2-56.7 ft. SANDSTONE, very light brown, silty, well cemented, condensation moisture
			SL		56.7-58.1 ft. SANDY SILTSTONE, light brown to reddish-brown, dry
60	RC	5.0			58.7-63.7 ft. SANDSTONE, light brown, well cemented, with thin siltstone/mudstone lenses at 60.5 and 61.1 ft.
65	RC	5.0	SS		63.7-68.7 ft. SANDSTONE, light brown, very fine grained, hard, well cemented
70	RC	5.0			68.7-73.7 ft. SANDSTONE, very light brown, very fine grained, hard, well cemented
75					73.7-76.2 ft. SANDSTONE, very light brown, very fine grained, hard, well cemented, dry

Notes:
Eco/Enviro Drilling drilled to 50 ft.; could not drill deeper consolidated formation.
Harrison-Cooper drillers moved 30 ft. NNE of original location, drilled to 50.7 ft. and set 6-in. ID PVC surface casing with top of casing 1.0 ft above land surface. Coring hole is 5-1/2 in., retrieved core diameter 3 in.
See MW-3 well completion log for monitor well installation details

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Safety & Environmental Solutions, Inc.

LOG OF BORING MW-3 (Composite)

Groundwater Investigation
Artesia Aeration
Maljamar, New Mexico
N1/2, Section 7, T17S, R32E

Date, Time Started:	: 10/30/07; 0900	Drilled By:	: Harrison-Cooper, Lubbock
Date, Time Completed	: 12/13/07; 1200	Logged By:	: D.G. Boyer, P.G., SESI
Hole Diameter:	: 9-7/8" pilot, 5-1/2" coring	Northing Coordinate	:
Drilling Method:	: Diamond coring bit	Easting Coordinate	:
Drilling Equipment:	: Ingersoll-Rand TH-60	Survey By	:

Sample Type:
RC Rock Coring Bit
CB Core Barrel (5 ft.)
CT Auger Cuttings
NR No recovery

Depth in Feet	Sample Method	Recovery (ft.)	USCS	GRAPHIC	DESCRIPTION
75	RC	5.0	SS CS		76.2-76.3 ft. CLAYSTONE 76.3-78.7 ft. SANDSTONE
80	RC	5.0			78.7-83.7 ft. SANDSTONE, very light brown, very fine grained, very hard, very well cemented, dry
85	RC	4.6			83.7-88.3 ft. SANDSTONE, very light brown, very fine grained, very hard, very well cemented, dry
90	RC	4.6	SS		88.3-92.9 ft. SANDSTONE, very light brown, very fine grained, very hard, very well cemented, dry
95	RC	4.6			92.9-97.5 ft. SANDSTONE, very light brown, very fine grained, very hard, very well cemented, dry
100					97.5-101.1 ft. SANDSTONE, very light brown, very fine grained, very hard, very well cemented, dry

Notes:
Eco/Enviro Drilling drilled to 50 ft.; could not drill deeper consolidated formation.
Harrison-Cooper drillers moved 30 ft. NNE of original location, drilled to 50.7 ft. and set 6-in. ID PVC surface casing with top of casing 1.0 ft above land surface. Coring hole is 5-1/2 in., retrieved core diameter 3 in.
See MW-3 well completion log for monitor well installation details

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Safety & Environmental Solutions, Inc.

LOG OF BORING MW-3 (Composite)

Groundwater Investigation
Artesia Aeration
Maljamar, New Mexico
N1/2, Section 7, T17S, R32E

Date, Time Started:	: 10/30/07; 0900	Drilled By:	: Harrison-Cooper, Lubbock
Date, Time Completed	: 12/13/07; 1200	Logged By:	: D.G. Boyer, P.G., SESI
Hole Diameter:	: 9-7/8" pilot, 5-1/2" coring	Northing Coordinate	:
Drilling Method:	: Diamond coring bit	Easting Coordinate	:
Drilling Equipment:	: Ingersoll-Rand TH-60	Survey By	:

Sample Type:
RC Rock Coring Bit
CB Core Barrel (5 ft.)
CT Auger Cuttings
NR No recovery

Depth in Feet	Sample Method	Recovery (ft.)	USCS	GRAPHIC	DESCRIPTION
100	RC	3.6	SS		101.1-102.2 ft. SANDSTONE, very light brown, very fine grained, very hard, very well cemented, dry
	RC	4.3	SS/CS		102.2-105.4 ft. SANDSTONE, with embedded brown-black clay/claystone inclusion, hard, dry
105	RC	4.0			105.2-108.9 ft. SANDSTONE, very light brown, very fine grained, very hard, very well cemented, dry, with increasing clay lenses at base. Clay thin, hard, well cemented
110	RC	4.1	SS/CS		108.9-109.1 ft. SANDSTONE, yellowish-brown, soft 109.1-109.3 ft. SANDSTONE, with brown CLAY inclusions, well cemented 109.3-109.5 ft. SANDSTONE and MUDSTONE, fractured but hard and dry 109.5-110.9 ft. SANDSTONE, with brown CLAY, inclusions, hard, dry 110.9-112.7 ft. SANDSTONE, light brown, very hard 112.7-113.0 ft. CLAY, hard, cemented (in core tip)
115	RC	4.0	SS		113.0-115.1ft. SANDSTONE, light brown, very hard
			SS/CL		115.1-115.4 ft. SANDSTONE, with CLAY inclusions
			LS		115.4-116.7 ft. LIMESTONE, light gray, with some microcrystals, very hard (wet-likely condensation or water from cleaning core tubes)
			SS/CL		116.7-117.0 ft. SANDSTONE and CLAY
	RC	4.0	SS		117.0-118.0 ft. SANDSTONE, yellowish-brown
			LS		118.0-118.1 ft. LIMESTONE, gray
			SS		118.1-119.5 ft. SANDSTONE
120			SS/CL		119.5-121.0 ft. SANDSTONE, CLAY
			LS		121-121.5 ft. LIMESTONE, light gray, very hard
			CS		121.5-122.3 ft. CLAYSTONE, light brown, mottled, fractures
			LS		122.3-123.9 ft. LIMESTONE, light gray, oolitic, fossil inclusions
			LS/SS		123.9-125.4 ft. LIMESTONE grading to SANDSTONE, SANDSTONE very light brown, very hard, core dry
125					

Notes:
Eco/Enviro Drilling drilled to 50 ft.; could not drill deeper consolidated formation.
Harrison-Cooper drillers moved 30 ft. NNE of original location, drilled to 50.7 ft. and set 6-in. ID PVC surface casing with top of casing 1.0 ft above land surface. Coring hole is 5-1/2 in., retrieved core diameter 3 in.
See MW-3 well completion log for monitor well installation details

Safety & Environmental Solutions, Inc.

LOG OF BORING MW-3 (Composite)

Groundwater Investigation
Artesia Aeration
Maljamar, New Mexico
N1/2, Section 7, T17S, R32E

Date, Time Started:	: 10/30/07; 0900	Drilled By:	: Harrison-Cooper, Lubbock
Date, Time Completed	: 12/13/07; 1200	Logged By:	: D.G. Boyer, P.G., SESI
Hole Diameter:	: 9-7/8" pilot, 5-1/2" coring	Northing Coordinate	:
Drilling Method:	: Diamond coring bit	Easting Coordinate	:
Drilling Equipment:	: Ingersoll-Rand TH-60	Survey By	:

Sample Type:
RC Rock Coring Bit
CB Core Barrel (5 ft.)
CT Auger Cuttings
NR No recovery

Depth in Feet	Sample Method	Recovery (ft.)	USCS	GRAPHIC	DESCRIPTION
125	RC	4.4	LS/SS		
			SS		125.4-125.9 ft. SANDSTONE
			MS		125.9-126.7 ft. MUDSTONE, gray, sandstone fragments
	RC	4.9			126.7-128.9 ft. "Redbeds", CLAY and CLAYSTONE, very hard, cemented, core dry but moist on outer surface only (condensation/wash water, driller cleaning barrel with water, not completly dry going in hole) 129 ft. Fracture zone, moist
130					129-130.3 ft. CLAY, "redbeds", moisture on core surface
	RC	4.3			130.3-132.4 ft. CLAY, "redbeds", moisture on core surface
					132.4-134.6 ft. CLAYSTONE/MUDSTONE "redbeds", hard, dry
135			CL/CS		
	RC	4.0			137.7-141.7 ft. CLAY and CLAYSTONE, "redbeds", some fractured rock, dry
140					
	RC	3.6			141.7-143.3 ft. CLAY and CLAYSTONE, "redbeds", brown
			CS		143.3-145.3 ft. CLAYSTONE, mottled then gray, hard, dry
145					
			CL/CS		145.3-146.8 ft. CLAY and CLAYSTONE "redbed", fractured 146.8-147.1 ft. CLAY and CLAYSTONE "redbed"
	RC	4.6	CL		147.1-147.5 ft. CLAY, gray
			CL/CS		147.5-149.9 ft. CLAY and CLAYSTONE "redbed"
150					

Notes:
Eco/Enviro Drilling drilled to 50 ft.; could not drill deeper consolidated formation.
Harrison-Cooper drillers moved 30 ft. NNE of original location, drilled to 50.7 ft. and set 6-in. ID PVC surface casing with top of casing 1.0 ft above land surface. Coring hole is 5-1/2 in., retrieved core diameter 3 in.
See MW-3 well completion log for monitor well installation details

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Safety & Environmental Solutions, Inc.

LOG OF BORING MW-3 (Composite)

Groundwater Investigation
Artesia Aeration
Maljamar, New Mexico
N1/2, Section 7, T17S, R32E

Date, Time Started:	: 10/30/07; 0900	Drilled By:	: Harrison-Cooper, Lubbock
Date, Time Completed	: 12/13/07; 1200	Logged By:	: D.G. Boyer, P.G., SESI
Hole Diameter:	: 9-7/8" pilot, 5-1/2" coring	Northing Coordinate	:
Drilling Method:	: Diamond coring bit	Easting Coordinate	:
Drilling Equipment:	: Ingersoll-Rand TH-60	Survey By	:

Sample Type:
RC Rock Coring Bit
CB Core Barrel (5 ft.)
CT Auger Cuttings
NR No recovery

Depth in Feet	Sample Method	Recovery (ft.)	USCS	GRAPHIC	DESCRIPTION
150	RC	4.7	CL/CS		149.9-151.2 ft. CLAY and CLAYSTONE "redbed"
					151.2-152.4 ft. CLAY and CLAYSTONE "redbed"
					152.4-154.6 ft. CLAY and CLAYSTONE "redbed", dry, fractures at 153.4 ft.
155	RC	5.0			154.6-159.6 CLAY and CLAYSTONE "redbed", reddish-brown, fractured in places, dry
160					
165					
170					
175					

Notes:
Eco/Enviro Drilling drilled to 50 ft.; could not drill deeper consolidated formation.
Harrison-Cooper drillers moved 30 ft. NNE of original location, drilled to 50.7 ft. and set 6-in. ID PVC surface casing with top of casing 1.0 ft above land surface. Coring hole is 5-1/2 in., retrieved core diameter 3 in.
See MW-3 well completion log for monitor well installation details

Jones, Brad A., EMNRD

From: David Boyer [dgboyer@sesi-nm.com]
Sent: Thursday, November 08, 2007 12:52 PM
To: Jones, Brad A., EMNRD
Cc: Jim Wilson
Subject: Drilling at Artesia Aeration

Brad,
To complete the 160 ft. boring at Artesia Aeration, we have tentatively scheduled an air rotary drilling rig with diamond-bit core sampling capabilty for Tuesday, November 20-21. The company is Harrison & Cooper out of Lubbuck who have the tools to collect a 5-ft. core sample in a sample tube of approximately the same diameter as used last week.

Would that date be convenient for you or a member of your staff to be on site to observe the drilling? The next available date for me will be during the week of December 3 as I have commitments the week of November 26.

David G. Boyer, P.G.
Hydrogeologist
Safety and Environmental Solutions, Inc.
P.O. Box 1613
703 E. Clinton, Suite #102
Hobbs, NM 88241
office 505-397-0510
fax 505-393-4388
cell 505-390-7067
email dgboyer@sesi-nm.com

Jones, Brad A., EMNRD

From: David Boyer [dgboyer@sesi-nm.com]
Sent: Monday, October 29, 2007 7:26 AM
To: Jones, Brad A., EMNRD
Subject: Aeration Drilling

Brad,
To confirm our conversation of last week, we will me tomorrow at 9:00 a.m. at the NMDOT rest area on US 82 which is 5.8 miles east of the intersection of US 82 and NM 529. The total distance is approximately 37 miles east of Artesia. If you have any questions, please give me a call. My cell phone number is 505 390-7067.
Dave

David G. Boyer, P.G.
Hydrogeologist
Safety and Environmental Solutions, Inc.
P.O. Box 1613
703 E. Clinton, Suite #102
Hobbs, NM 88241
office 505-397-0510
fax 505-393-4388
cell 505-390-7067
email dgboyer@sesi-nm.com

Jones, Brad A., EMNRD

From: Jones, Brad A., EMNRD
Sent: Wednesday, October 17, 2007 4:29 PM
To: 'David Boyer'
Cc: Jim Wilson; Price, Wayne, EMNRD
Subject: RE: Artesia Aeration -- Change in Monitor Well Depth

Jim and David,

I will attach this email to the October 11, 2007 monitoring well installation work plan and accept it as an official revision. The Oil Conservation Division (OCD) has reviewed the attached document and determined that the October 11, 2007 proposal with this revision (to increase the final depth of the well to 160 feet) is adequate to proceed with the site investigation. It should be understood that if a monitoring well is constructed, it shall be bailed until fully developed. Please provide directions to the proposed site and a confirmed start time and date for the drilling activities. OCD representatives will be present prior to any drilling for confirmation of the proposed drilling location of MW-3.

Brad

Brad A. Jones
Environmental Engineer
Environmental Bureau
NM Oil Conservation Division
1220 S. St. Francis Drive
Santa Fe, New Mexico 87505
E-mail: brad.a.jones@state.nm.us
Office: (505) 476-3487
Fax: (505) 476-3462

From: David Boyer [mailto:dgboyer@sesi-nm.com]
Sent: Wednesday, October 17, 2007 4:11 PM
To: Jones, Brad A., EMNRD
Cc: Jim Wilson
Subject: Artesia Aeration -- Change in Monitor Well Depth

Brad,

Jim Wilson just called and per your request we are increasing the final depth of the monitor well to 160 ft. We are sending you a correction to work plan that reflects that change. Please make the change in your current work plan.

We are preparing to drill the monitor well on Tuesday, October 30 and will stop at the depth specified in the work plan to observe if shallow water enters the borehole. Please let us know the anticipated time of your arrival at the job site.

Thank you for your prompt review of the work plan,

David G. Boyer, P.G.
Hydrogeologist
Safety and Environmental Solutions, Inc.
P.O. Box 1613
703 E. Clinton, Suite #102
Hobbs, NM 88241
office 505-397-0510
fax 505-393-4388
cell 505-390-7067
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Hobbs, New Mexico 88240
505/397-0510
FAX 505/393-4388
www.sesi-nm.com

Safety & Environmental Solutions, Inc.

October 11, 2007

Mr. Brad A. Jones
Environmental Engineer
New Mexico Oil Conservation Division
1220 South St. Francis Drive
Santa Fe, New Mexico 87505

Subject: Artesia Aeration Monitoring Well Installation/Work Plan, July 26, 2007
Request for Additional Information
Artesia Aeration Landfarm: Permit NM-01-0030
Location: Section 7, Township 17 South, Range 32 East, NMPM
Lea County, New Mexico

Dear Mr. Jones:

This letter is in response to your letter of August 6, 2007 and subsequent telephone discussions providing comments on the work plan. You requested that we provide additional information before performing additional site characterization and investigative work, including drilling and installing of additional boreholes or monitor wells.

Specifically you requested submittal of a revised boring plan that addresses the recommendations provided in the letter including the method of drilling, the plan to continuously core, proposed construction design details of the monitoring well, procedures to determine if groundwater is present and a surveyed site map showing the proposed boring location. A revised work plan addressing the comments was provided to your office on September 28, 2007.

The current work plan, dated October 11, 2007 and enclosed with this letter, addresses remaining comments discussed last week in a telephone conversation. Specially, the changes included moving the proposed location of MW-3 to northwest of the proposed expansion area, waiting a minimum of 18 hours (overnight) to see if water enters the borehole at the elevation seen in MW-2 and assuming the maximum depth of a lined pit may exceed 25 ft. due to installation/design issues

Following your review and our addressing any further concerns you may have, and subsequent to OCD approval, we will set a drilling date and provide you with a 14-day notification of that date so that a representative of the agency can be present to witness the work.

If you have any questions, please contact me at (505) 397-0510.

Sincerely,

David G. Boyer, P.G.

Cc. Jim Wilson, Artesia Aeration
OCD District I Office, Hobbs

Work Plan
Artesia Aeration
Monitor Well Installation
Section 7, Township 17S, Range 32E
Lea County, New Mexico

Revised October 11, 2007

Prepared for:

Artesia Aeration
5614 Lovington Highway
Hobbs, NM 88240

By:

Safety & Environmental Solutions, Inc.
703 E. Clinton Suite 102
Hobbs, New Mexico 88240
(505) 397-0510

TABLE OF CONTENTS

I. Company/Agency Contacts

Name	Company	Telephone	e-mail
Jim Wilson	Artesia Aeration	505-746-9862 (o) 505-703-8383 (c)	marlaena@valornet.com
David Boyer, P.G.	SESI	505-397-0510 (o) 505-390-7067 (c)	dgboyer@sesi-nm.com

II. Purpose

The purpose of this work plan is to propose drilling and construction details of a ground water monitor well at the Artesia Aeration facility, which is located in Section 7, Township 17S, Range 32E, Eddy County, New Mexico. The facility location is located on private land approximately two miles west of the unincorporated community of Maljamar and is adjacent to and on the north side of US Highway 82. The location of the facility is shown in Figure 1.

III. Background

Artesia Aeration is an NM Oil Conservation Division (OCD) facility approved for the land farm remediation of hydrocarbon-contaminated soil resulting from current and past spills, leaks or other releases of petroleum hydrocarbon associated with the drilling and production of oil and natural gas. The facility desires to receive for long term encapsulation salt-contaminated soil resulting from produced water spills and leaks from said operations and is preparing an application for submittal to the OCD. The salt contaminated material will be placed in lined pits with a maximum depth, including liners, of 25 ft. beneath the land surface. The maximum area within the facility where such proposed pits may be located is shown on Figure 2, the topographic survey, as "Proposed Expansion Area".

As part of the application, Artesia Aeration will provide the OCD with information on groundwater, or lack thereof, in the vicinity of the proposed disposal pits. Safety and Environmental Solutions, Inc., has been engaged to supervise drilling and installation of a deep monitor well and will collect lithologic core samples and provide a report on the findings.

IV. Groundwater

Groundwater is generally absent in the area to the west of the Ogallala caprock at Maljamar. The lack of potable groundwater west of the caprock has been documented in several reports by the NM Bureau of Mines and the US Geological Survey (see Section VI, References).

There are three existing monitor wells on the property. Two are dry, including one drilled to a depth of 120 ft. located near the entrance to the property (see Figure 2, the topographic survey, showing the location of that well, MW-D1). The third well (MW-2) is located at the south end of, and between, cells 5 and 6. The well is adjacent to the Highway 82 bar ditch and shows a very thin saturated zone on top of red bed clays that is thought to be due to infiltration from intermittent ponded water in the ditch. Well construction information and water level measurement history is submitted in the Appendix and as Table 1, respectively. Updated information on all current and proposed wells will be submitted with the disposal application.

V. Action Plan

The following action plan for the location and construction of the proposed monitor well is presented below. A diagram of the proposed well is shown as Figure 4.

1. The proposed site of the new monitor well, identified as MW-3, will be in the northwest area of the facility just to the west and outside of the proposed expansion area. The proposed location is shown on Figure 2. An elevated pad and access road will be constructed to the site and the well will be elevated above the surrounding surface. It will be marked and New Mexico One-Call will be contacted to provide buried line identification within a radius of 50 ft. of the proposed drill location.

2. The proposed monitor well (MW-3) will be drilled to a depth of 155 ft. below land surface (BLS). This depth was determined in the following manner. At the location of the proposed well, the surface elevation is approximately 4,017 ft. above mean sea level (Figure 2). We expect a well pad will be constructed at the location which might be as much as 4 to 5 ft. above the existing land surface making the ground elevation at the location as much as 4,022 ft.

   We have not prepared, nor is it necessary to prepare, detailed drawings of the pits at this stage of the investigation where we are determining the suitability of the site for its intended use. Knowing the extent of the pit area and maximum depth of the pits is sufficient to determine a drilling and monitor well target depth. For this submittal, it was determined as follows: The surface elevation of any proposed pit furthermost from and topographically downgradient from the proposed well is just over 4,000 ft. The maximum planned depth of the pits including liners and the leak detection system will be 25 ft. However, to allow for possible installation issues, a maximum depth of 30 ft. will be used for determination of the drilling depth. A depth 100 ft. below the maximum depth will be at an elevation of 4,000 ft. minus 30 ft. minus 100 ft., or 3,870 ft. below land surface (BLS). The difference in elevation between that at the proposed well pad location (4,022 ft.) and 3,870 ft. is 152 ft. As coring is performed in 5 ft. intervals, the maximum depth of the boring/well is proposed to be 155 ft.

3. The drilling equipment to be used will be a hollow-stem auger with a five-foot splitspoon core barrel for collection and examination of lithologic samples. The core barrel will be advanced and samples will be taken continuously from the surface to total depth in five-foot intervals. Detailed geologic logs will be maintained for each well. The picture in Figure 3, from an unrelated location, shows a typical recovery core using this method. Changes in lithology, color, grain size, etc. are easily logged using this method of sample recovery. The monitor well and boring information provided in the appendix was collected using this method of sampling.

4. The drilling and coring shall continue until the water bearing zone encountered in MW-2 is reached. This is expected to be at a depth of about 30-35 ft. based on the difference in elevation between the two locations and factoring in a pad elevation of 4-5 ft. above the land surface. It will also likely be at or close to the contact of the alluvial sand and the underlying clay redbeds. When this depth is reached, drilling will cease and a temporary screen and casing installed. We will wait a minimum of 18 hours (i.e. overnight) for water, if present to enter the casing. If water is present and following consultation with the OCD, the temporary well will be re-completed as a shallow 2-inch diameter monitor well with ten feet of screen and to the installation specifications as described in #5 below.

5. If no water is encountered, drilling will continue as described in this section. The deep well will be completed as a 2-inch diameter monitor well with ten feet of screen, a sand filter pack two feet above the top of the screen, a two-foot bentonite seal (hydrated), and with a bentonite-cement grout to the surface. Surface completion will be a steel, above ground protection casing with a locking cap and a cement pad. An example of a monitor well with these construction details is shown in Figure 4.
6. If water is encountered in the shallow borehole and following consultation with OCD, a second boring will be drilled to the original target depth of 155 ft. using the following methodology. A 10 or 12 in. string of steel surface casing will be installed several feet into the dry clay redbeds and cemented back to the surface. We expect to use a local anchor drilling company to bore the hole and our driller will install and cement the casing. Following cement setup, we will drill through the bottom of the surface casing and continue coring as described above. The second well will be completed as described in #5 above.
7. OCD will be notified at least 14-days in advance of the drilling so that an OCD representative can make the necessary arrangements to be present at the site during the drilling and installation of the monitor well.
8. Following completion of the well, a drilling log, well installation log and narrative report will be completed and submitted to Artesia Aeration, NM OCD and the NM State Engineer Office. Water level measurements and water quality sampling will be performed on a frequency and for constituents as required by the NM OCD.

VI. References

Ash, S.R., 1963. Ground-water conditions in northern Lea County, New Mexico: U.S. Geological Survey, Hydrologic Investigations Atlas, HA-62, 2 plates.

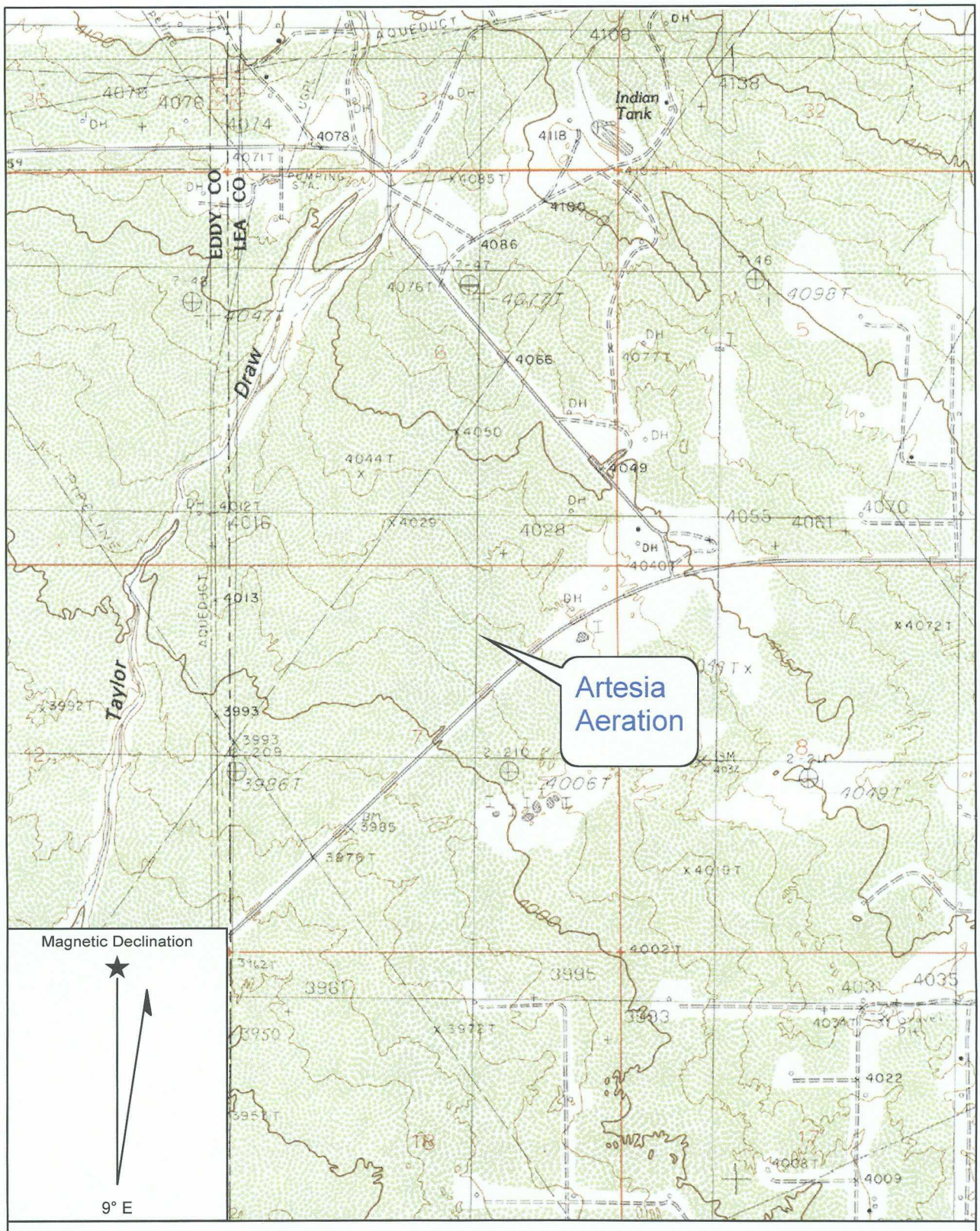
Nicholson, A. Jr., and Clebsch, A. Jr., 1961. Geology and ground-water conditions in southern Lea County, New Mexico: N. Mexico Institute of Mining and Technology, State Bureau of Mines and Mineral Resources Ground Water Report #6, 123 p.

VII. Work Plan Table and Figures

Table 1. Water Level Measurements, Artesia Aeration, Lea County, New Mexico

Monitor Well Name, Total Depth Below TOC (feet)	Elevation Top of Casing (feet)	Ground Level Elevation (feet), Note	Date Measured	Depth to Water Below TOC (feet)	Water Level Elev. (feet)	Water Saturated Thickness (feet)	Water Level Change (ft)
MW-1	4,036.21	4,032.91	05/21/05	Dry	- -	- -	- -
28.02			06/01/05	Dry	- -	- -	- -
			06/03/05	Dry	- -	- -	- -
			06/08/05	Dry	- -	- -	- -
			06/29/05	Dry	- -	- -	- -
			07/12/05	Dry	- -	- -	- -
			07/14/05	Dry	- -	- -	- -
			07/22/05	Dry	- -	- -	- -
			07/26/05	Dry	- -	- -	- -
			08/02/05	Dry	- -	- -	- -
			08/05/05	Dry	- -	- -	- -
			08/09/05	Dry	- -	- -	- -
			12/15/05	Dry	- -	- -	- -
			08/13/07	Dry	- -	- -	- -
MW-2	4,015.60	4,012.42	05/29/05	24.49	3,991.11	3.8	- -
28.32		*	06/01/05	24.59	3,991.01	3.7	-0.10
		*	06/03/05	24.56	3,991.04	3.8	0.03
		*	06/08/05	24.66	3,990.94	3.7	-0.10
		*, 10:30 am	06/29/05	24.97	3,990.63	3.4	-0.31
		*, 3:45 pm	06/29/05	25.24	3,990.36	3.1	-0.27
		*	07/12/05	25.22	3,990.38	3.1	0.02
		*	07/14/05	25.24	3,990.36	3.1	-0.02
		*	07/22/05	25.39	3,990.21	2.9	-0.15
		*	07/26/05	25.43	3,990.17	2.9	-0.04
		*	08/02/05	21.60	3,994.00	6.7	3.83
		*	08/05/05	21.07	3,994.53	7.3	0.53
		*	08/09/05	21.01	3,994.59	7.3	0.06
			12/15/05	23.33	3,992.27	5.0	-2.32
		*	08/13/07	24.35	3,991.25	4.0	-1.02
MW-3	- -		Not drilled	- -	- -	- -	- -
- -							
MW-D1	4,037.08	4,032.40	05/13/99	Dry	- -	- -	- -
124.68			05/21/05	Dry	- -	- -	- -
			08/13/07	Dry - unable to determine total depth			- -
Locations surveyed 08/08/07							
* - Pumped dry after measurement							

Figure 1. Location Map, Artesia Aeration, Lea County, New Mexico

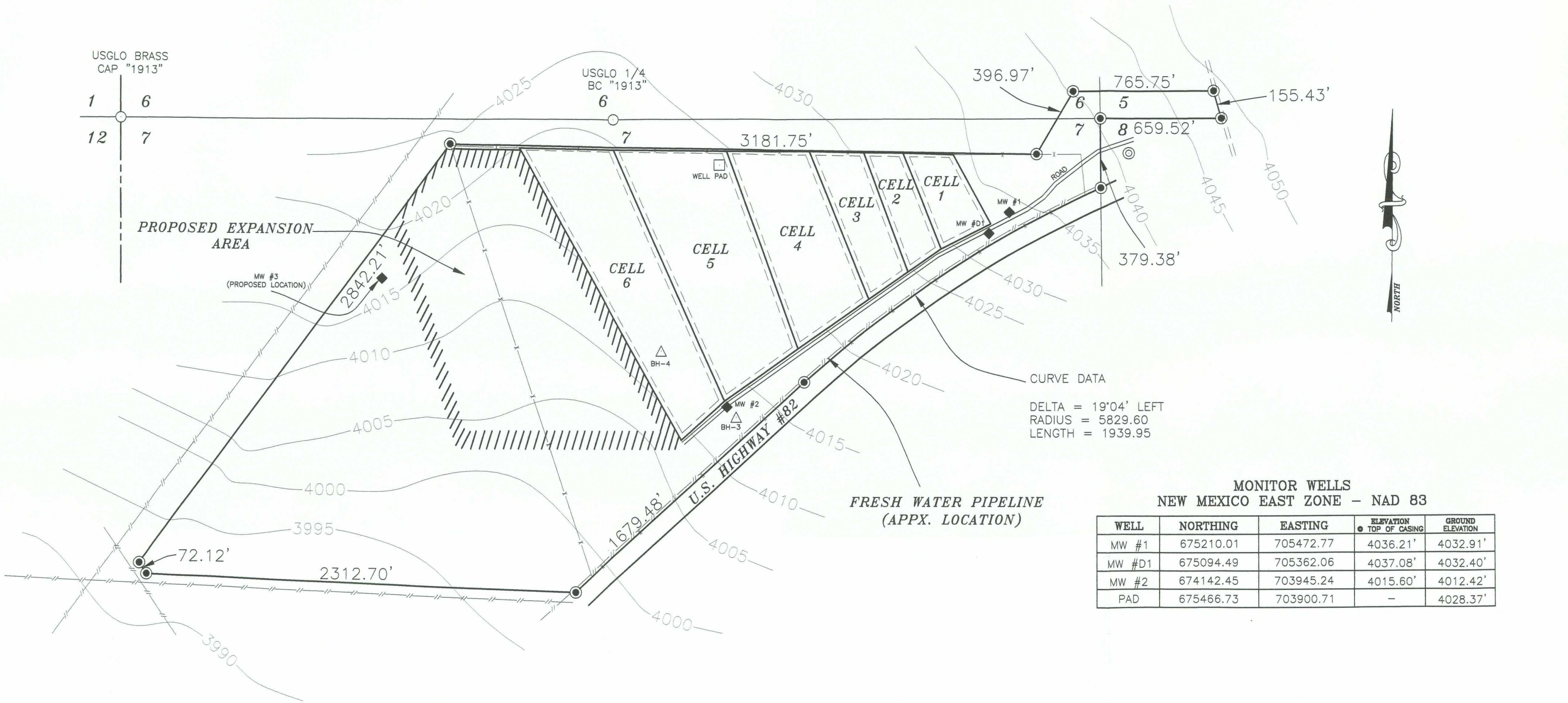


Name: MALJAMAR
Date: 10/11/2007
Scale: 1 inch equals 2000 feet

Location: 032° 51.2685' N 103° 48.1781' W NAD 83
Caption: Figure 1. Location Map, Artesia Aeration, Lea County, New Mexico

Figure 2. Topographic Survey, Artesia Aeration
Lea County, New Mexico

TOPOGRAPHIC SURVEY OF ARTESIA AERATION LLC LAND FARM IN SECTIONS 5, 6, & 7, TOWNSHIP 17 SOUTH, RANGE 32 EAST, N.M.P.M., LEA COUNTY, NEW MEXICO



CURVE DATA

DELTA = 19°04' LEFT
RADIUS = 5829.60
LENGTH = 1939.95

MONITOR WELLS
NEW MEXICO EAST ZONE – NAD 83

WELL	NORTHING	EASTING	ELEVATION @ TOP OF CASING	GROUND ELEVATION
MW #1	675210.01	705472.77	4036.21'	4032.91'
MW #D1	675094.49	705362.06	4037.08'	4032.40'
MW #2	674142.45	703945.24	4015.60'	4012.42'
PAD	675466.73	703900.71	–	4028.37'

NOTES:
HORIZONTAL COORDINATES WERE ESTABLISHED BY USING GPS (GLOBAL POSITIONING SYSTEM). AND ARE NEW MEXICO EAST ZONE, NAD 83, U.S. SURVEY FEET VALUES.

ELEVATIONS WERE ESTABLISHED BY CONVENTIONAL LEVELING BASED OFF MONUMENT "WILSON", ELEVATION OF 4042.99' (NAVD 88).

TERRY J. ASEL
NEW MEXICO
15079
REGISTERED PROFESSIONAL SURVEYOR

RTIFICATE

IEW MEXICO PROFESSIONAL SURVEYOR
:EBY CERTIFY THAT I CONDUCTED AND AM
R THIS SURVEY, THAT THIS SURVEY IS TRUE
THE BEST OF MY KNOWLEDGE AND BELIEF,
MINIMUM STANDARDS FOR SURVEYING IN
ADOPTED BY THE NEW MEXICO STATE
'RATION FOR PROFESSIONAL ENGINEERS

). Asel 10-9-2007
N.M. R.P.S. No. 15079

LEGEND

◆ – DENOTES MONITOR WELL
△ – DENOTES BORE HOLE
◉ – DENOTES PROPERTY CORNER
◎ – DENOTES SET 1/2" REBAR W/PVC CAP MARKED ASEL CONTROL PT. (WILSON) BENCHMARK FOR ELEVATIONS

Asel Surveying
& Consulting

P.O. BOX 393 – 310 W. TAYLOR
HOBBS, NEW MEXICO – 505-393-9146

500' 0 500' 1000' FEET
SCALE: 1"=500'

ARTESIA AERATION LLC

TOPOGRAPHIC SURVEY OF ARTESIA AERATION LLC LAND FARM IN SECTIONS 5, 6, & 7, TOWNSHIP 17 SOUTH, RANGE 32 EAST, N.M.P.M., LEA COUNTY, NEW MEXICO.

Survey Date: 08/08/2007	W.O. Number: 070808MW-REV.B
	File: 070808MW-REV.B.DWG
Date: 10/09/2007	Drafted By: KA

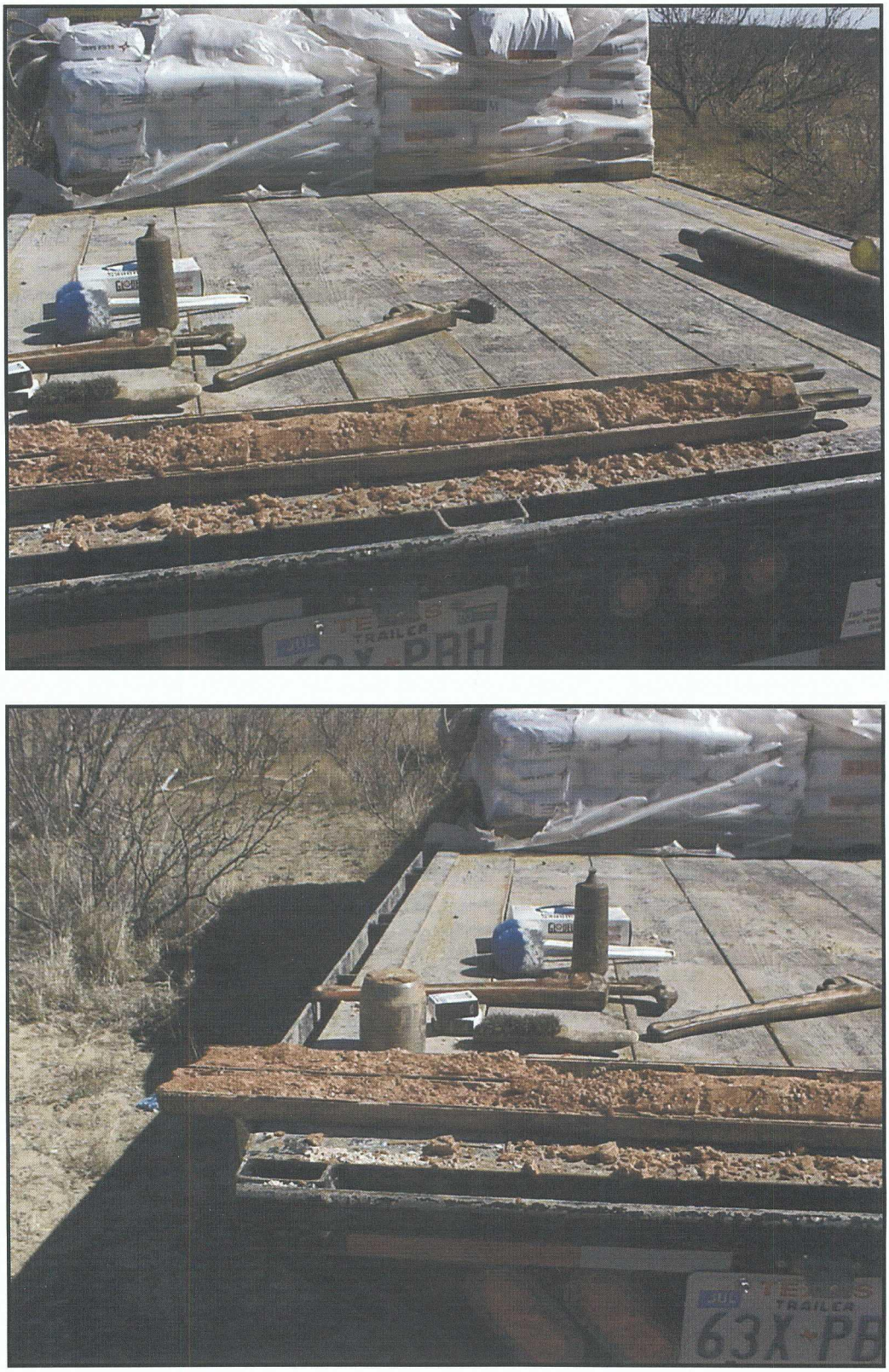


Figure 3. Example of five-foot core barrel sampling method (from an unrelated location)

Figure 4. Diagram of Proposed Monitor Well Construction

EXAMPLE LOG OF PROPOSED WELL

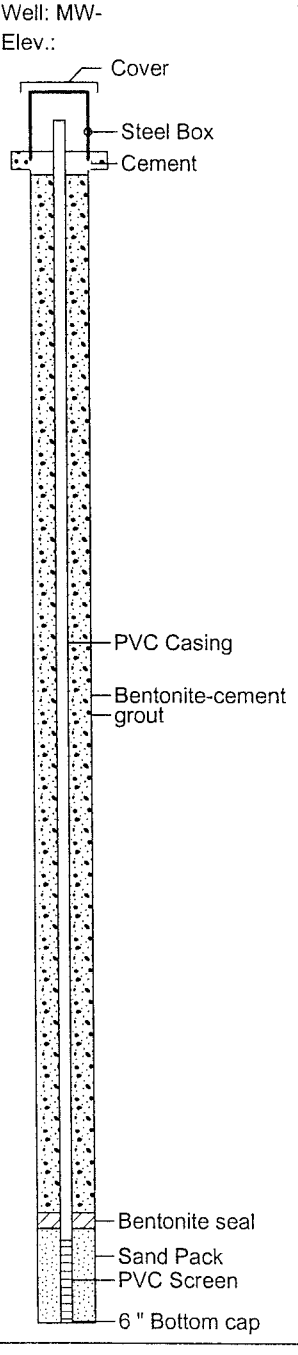
(Page 1 of 1)

Groundwater Investigation
Artesia Aeration
Maljamar, New Mexico
N1/2, Section 7, T17S, R32E

Date, Time Started:	:	Drilled By:	: Eco/Enviro Drilling
Date, Time Completed	:	Logged By:	: D.G. Boyer
Hole Diameter:	: 8 1/4"	Northing Coordinate	:
Drilling Method:	: Hollow Stem Auger	Easting Coordinate	:
Drilling Equipment:	: Foremost-Mobile B-57	Survey By	:

Sample Type:
SS Split Spoon (18" or 24")
CB Core Barrel (2' or 5')
CT Auger Cuttings
NR No recovery

Depth in Feet	Sample Type	USCS	DESCRIPTION
0–25	CB	SP	0-25 ft. SAND
25–40	CB	CL	25-40 ft. CLAY, green
40–100	CB	CL/CA	40-100 ft. Red CLAY and CALICHE
100–110	CB	CA	100-110 ft. CALICHE
110–120	CB	CL	110-120 ft. CLAY, Red and Green
120–150	CB	??	120-150 ft. (Unknown)



Well Construction Information

COMPLETION DATA

Hole Depth	: 150 ft. Below LS
TD Inside casing	: 154 ft. Below TOC

CASING, SCREEN & CAP

Material, joints	: PVC, threaded
Diameter	: 2 in. ID
Manufacturer	: LAIBE
Screen type	: Slotted
Screen length	: 10 ft.
Screen opening	: 0.020 slot
Scrn. placement	: 140-150 ft. BLS
Sump	: None
Bottom Cap	: 0.5 ft PVC
Protector Casing	: Steel box
Lock Key #	: - -

SEALS & SAND PACK

Cement seal type	: Concrete
Cem't placement	: 0 - 3 ft. BLS
Grout placement	: - -
Annular seal type	: Bentonite chips
Seal volume	: __ bags, hydrated
Seal placement	: 3-138 ft. BLS
Sand pack type	: 8/16 Oglebay silica
Sand volume	: __ bags
Sand placement	: 138-150 ft. BLS
Lower Annular seal	: - -
Seal placement	: - -

ELEVATIONS

Ground elevation	: Approx. 4025 ft.
Inner casing, top	: - -

WELL INSTALLATION:
Drilled to 150 feet with 8 1/4" auger to determine lithology. Installed well with 10 ft. screen. __ bags 8/16 Oglebay-Norton sand to 138 ft., __ bags bentonite chips to 3 ft., hydrated. Cement mix to surface. Installed locking steel protection casing, stick-up approximatel 4 ft.

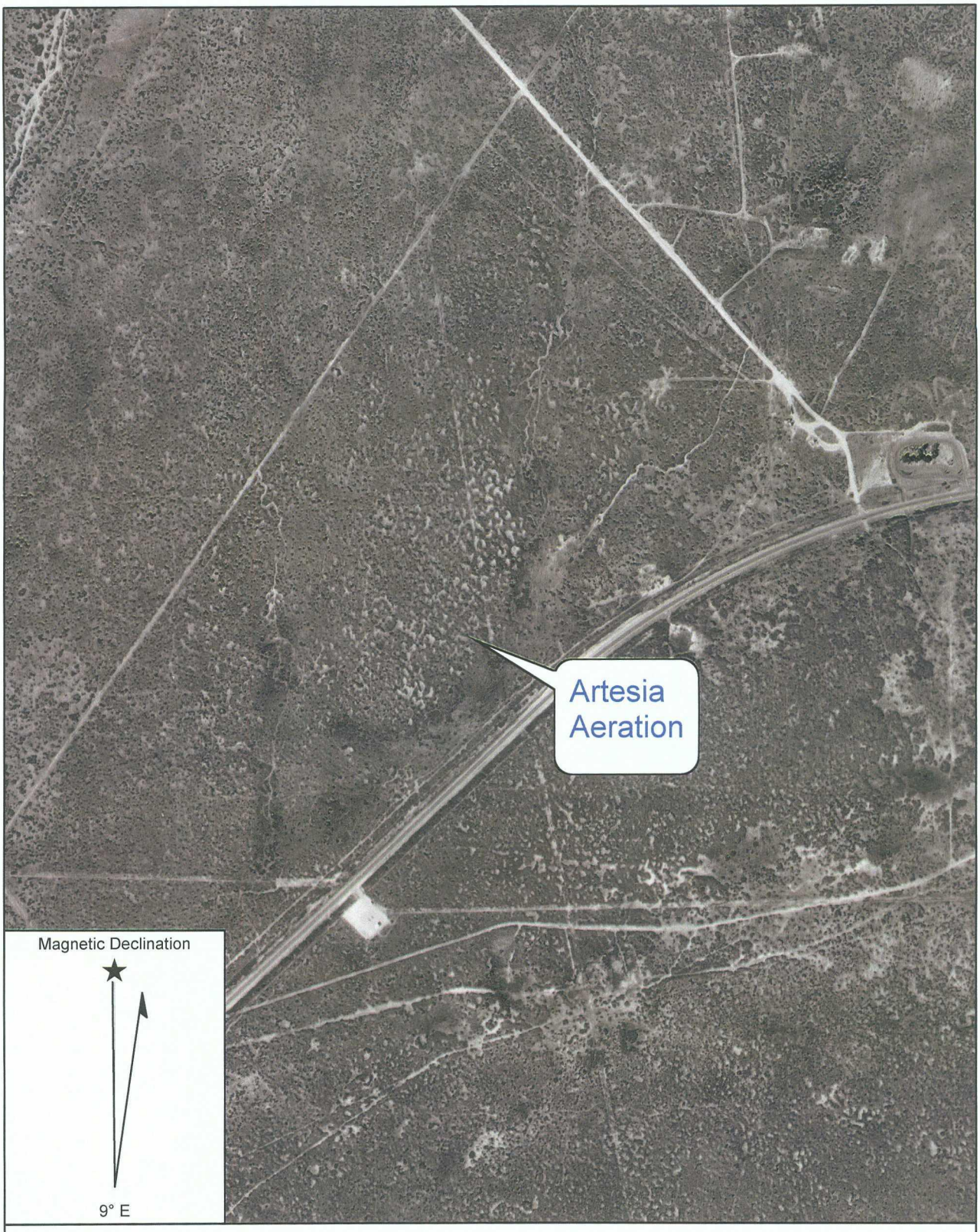
WELL DEVELOPMENT:

Notes:
Location northeast corner cell 5.
Sample lithology taken from existing deep well drilled to 120 ft. in 1999.

\\Sescentral\ES\Central\Company Files\Artesia Aeration\ARA-07-001 2007 Monitor Well and Plan\Proposed Deep Mon Well.BOR

VIII. Appendix - Supporting Information:

- **USGS Aerial Photograph (1996)**
- **Borehole/Monitor Well Logs**



Name: MALJAMAR NE, NM
Date: 10/11/2007
Scale: 1 inch equals 1000 feet

Location: 032° 51.2475' N 103° 48.1845' W NAD 83
Caption: Aerial Photograph, Artesia Aeration, Lea County, New Mexico (October, 1996)

Revised June 1972

STATE ENGINEER OFFICE

WELL RECORD

Section 1. GENERAL INFORMATION

(A) Owner of well Artesia Aeration LLC Owner's Well No. _____

Street or Post Office Address P.O. Box 248

City and State Artesia N.M. 88210

Well was drilled under Permit No. _____ and is located in the:

a. _____ ¼ _____ ¼ _____ ¼ _____ ¼ of Section _____ Township _____ Range _____ N.M.P.M.

b. Tract No. _____ of Map No. _____ of the _____

c. Lot No. _____ of Block No. _____ of the _____
Subdivision, recorded in Lea County.

d. X= _____ feet, Y= _____ feet, N.M. Coordinate System _____ Zone in the _____ Grant.

(B) Drilling Contractor C&R DRILLING License No. 763

Address 7217 ROSWELL HWY. ARTESIA N.M. 88210

Drilling Began 5-12-99 Completed 5-13-99 Type tools Rotary Size of hole 7½ in.

Elevation of land surface or _____ at well is _____ ft. Total depth of well 120 ft.

Completed well is ☒ shallow ☐ artesian. Depth to water upon completion of well 0 ft.

Section 2. PRINCIPAL WATER-BEARING STRATA

Depth in Feet From	Depth in Feet To	Thickness in Feet	Description of Water-Bearing Formation	Estimated Yield (gallons per minute)

Section 3. RECORD OF CASING

Diameter (inches)	Pounds per foot	Threads per in.	Depth in Feet Top	Depth in Feet Bottom	Length (feet)	Type of Shoe	Perforations From	Perforations To

Section 4. RECORD OF MUDDING AND CEMENTING

Depth in Feet From	Depth in Feet To	Hole Diameter	Sacks of Mud	Cubic Feet of Cement	Method of Placement
0	20	7½"	1gel		By hand

Section 6. LOG OF HOLE

Depth in Feet From	Depth in Feet To	Thickness in Feet	Color and Type of Material Encountered
0	25	25	Sand
25	40	15	Green clay
40	110	60	Red clay & caliche
110	110	10	Caliche
110	120	10	Red clay & green clay

Section 7. REMARKS AND ADDITIONAL INFORMATION

Monitaring Hole

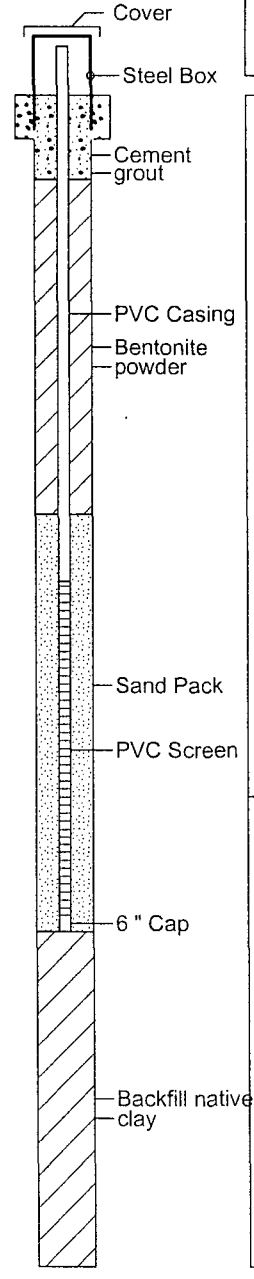
LOG OF WELL MW-1

Groundwater Investigation
Artesia Aeration
Maljamar, New Mexico
N1/2, Section 7, T17S, R32E

Date, Time Started:	: 05/14/05; 0900	Drilled By:	: Eco/Enviro Drilling
Date, Time Completed	: 05/14/05; 1430	Logged By:	: D.G. Boyer, SESI
Hole Diameter:	: 8 1/4"	Northing Coordinate	:
Drilling Method:	: Hollow Stem Auger	Easting Coordinate	:
Drilling Equipment:	: Foremost-Mobile B-57	Survey By	:

Sample Type:
SS Split Spoon (18 in. or 24 in.)
CB Core Barrel (5 ft.)
CT Auger Cuttings
NR No recovery

Depth in Feet	Surf. Elev. 4033	Sample Type	Recovery (ft.)	USCS	GRAPHIC	DESCRIPTION
0						
	4030	CT		SP		0-4 ft. SAND, poorly graded (uniform), light brown, fine grained, dry
5				CA		4-6 ft. CALICHE, white (chalk color), dry
	4025	CT		SP		6-10 ft. SAND, poorly graded (uniform), light brown, fine grained, frequent small caliche gravels/fragments to 1/4", dry 9-10 ft. Increasing caliche gravels and silt
10						
	4020	CT		ML		10-15 ft. SANDY SILT, very light brown, with occasional caliche gravel, very dry
15						
	4015	CT		SP		15-20 ft. SILTY SAND, light reddish brown, very fine grained, dry
20						
	4010	CB	1.9			20-23 ft. SAND, reddish-brown, very fine grained, dry
				CL		23-25 ft. CLAY, brown, very stiff, dry, very plastic when wetted
25						25-27 ft. CLAY, brown, very stiff, dry
	4005	CB		CL/MS		27-30 ft. CLAY, green, some platey structure (claystone or mudstone), very fine crystals (calcite?), dry
30						30-33 ft. CLAY, brown and yellow, dry, crumbly
	4000	CB	1.8			33-34 ft. CLAY and claystone (mudstone), greenish gray, platey, crumbly, dry 34-35 ft. CLAY, grayish grading to brown at base, crumbly, dry
35						



Well Construction Information

COMPLETION DATA

Hole Depth	: 35 ft. Below LS
TD Inside casing	: 27.5 ft. Below TOC

CASING, SCREEN & CAP

Material, joints	: PVC, threaded
Diameter	: 2 in. ID
Manufacturer	: LAIBE
Screen type	: Slotted
Screen length	: 10 ft.
Screen opening	: 0.020 slot
Scrn. placement	: 15-25 ft. BLS
Sump	: None
Bottom Cap	: 0.5 ft PVC
Protector Casing	: Steel box
Lock Key #	: - -

SEALS & SAND PACK

Cement seal type	: QuikCrete
Cem't placement	: 0 - ~2.5 ft. BLS
Grout placement	: - -
Annular seal type	: Aquagel bentonite
Seal volume	: 4 bg powder, hydrated
Seal placement	: 2.5-12.5 ft. BLS
Sand pack type	: 8/16 Oglebay silica
Sand volume	: 6 bags
Sand placement	: 12.5-25 ft. BLS
Lower Annular seal	: Native clay (backfill)
Seal placement	: 25-35 BLS

ELEVATIONS

Ground elevation	: Approx. 4035 ft.
Inner casing, top	: - -

WELL INSTALLATION:
Drilled to 35 feet with 8 1/4" auger to determine lithology. Backfilled to 25 ft. and installed well with 10 ft. screen. 6 bags 8/16 Oglebay-Norton sand to 12.5 ft., 4 bags Aquagel bentonite powder to 2.5 ft., hydrated. QuikCrete cement mix to surface. Installed locking steel protection casing, stick-up approximatel 2.5 ft.

WELL DEVELOPMENT:
None - well dry, 5/14/05

Notes:
Monitor well dry upon completion.
Location approximately 15 ft. north of service road between entrance and landfarm Cell 1.

\\Sescentral\ses\Central\Company Files\Artesia Aeration\Boring-well Logs\MW-1 Well.BOR

LOG OF WELL MW-2

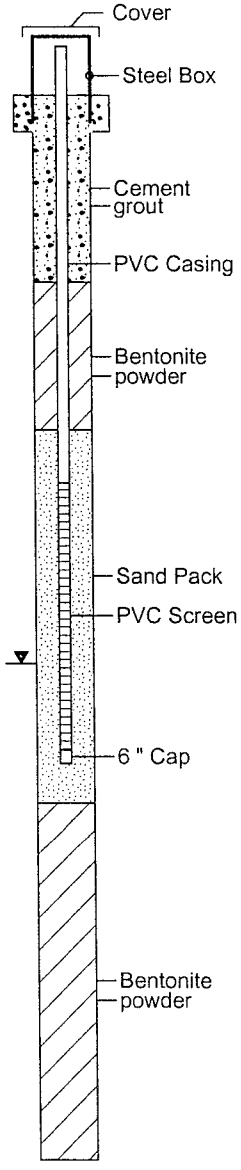
Groundwater Investigation
Artesia Aeration
Maljamar, New Mexico
N1/2, Section 7, T17S, R32E

Date, Time Started:	: 05/27/05; 1130	Drilled By:	: Eco/Enviro Drilling
Date, Time Completed	: 05/27/05; 1700	Logged By:	: D.G. Boyer, SESI
Hole Diameter:	: 8 1/4"	Northing Coordinate	:
Drilling Method:	: Hollow Stem Auger	Easting Coordinate	:
Drilling Equipment:	: Foremost-Mobile B-57	Survey By	:

Sample Type:
SS Split Spoon (18 in. or 24 in.)
CB Core Barrel (5 ft.)
CT Auger Cuttings
NR No recovery

Depth in Feet	Surf. Elev. 4012	Sample Type	Recovery (ft.)	USCS	GRAPHIC	DESCRIPTION
0						
	4010	CT		SP		0-5 ft. SAND, reddish brown, fine grained, uniform, dry
5						
	4005	CT				5-10 ft. SAND, brown to reddish brown, very fine to fine grained, slightly damp, caliche fragments to 1/2 in. at base
10						
	4000	CT				10-12 ft. SAND, brown to reddish brown, very fine to fine grained
				SP/GP		12-14 ft. GRAVELLY SAND, sand brown, fine grained, with granitic gravels to 1.5 in. Large gravels angular, smaller gravels rounded, quartz common in gravels
15				SP		
	3995	CT		SC		14-15 ft. SAND, as above
						15-20 ft. CLAYEY SAND, grading to sandy clay at 20 ft. Possible contact with redbeds.
20						
	3990	CB	2	CL		20-25 ft. GRAVELLY SILTY CLAY/ GRAVELLY SANDY CLAY, reddish brown, with very hard caliche in tip, gravels are caliche gravels.
25						
	3985	CB	5	CL		25-28.5 ft. CLAY, reddish brown, very dry (redbed) 28.5-29 ft. CLAY, green-gray-brown striations, very dry
30				CL/CS		
	3980	CB	5	CL		29-31 ft. CLAY and CLAYSTONE, clay brown, claystone dark brown, partially consolidated, poorly cemented, very dry
				MS		31-33.1 ft. CLAY, reddish brown, stiff, very dry, powdery when broken
35				CL/CS		
	3975	CB	5	CS		33.1-35 ft. CLAYSTONE, dark brown, poorly consolidated, poorly cemented, dry
40						35-35.9 ft. CLAY and CLAYSTONE, reddish-brown, very dry
						36.9-40 ft. CLAYSTONE, dark brown, poorly cemented, occasional green inclusions (pea size), occasional caliche streak,

Well: MW-2
Elev.:



Well Construction Information

COMPLETION DATA

Hole Depth	: 40 ft. Below LS
TD Inside casing	: 28.29 ft. Below TOC

CASING, SCREEN & CAP

Material, joints	: PVC, threaded
Diameter	: 2 in. ID
Manufacturer	: LAIBE
Screen type	: Slotted
Screen length	: 10 ft.
Screen opening	: 0.020 slot
Scrn. placement	: 15-25 ft. BLS
Sump	: None
Bottom Cap	: 0.5 ft PVC
Protector Casing	: Above grade steel
Lock Key #	: - -

SEALS & SAND PACK

Cement seal type	: QuikCrete
Cem't placement	: 0 - 7 ft. BLS
Grout placement	: - -
Annular seal type	: Aquagel bentonite
Seal volume	: 3 bg powder, hydrated
Seal placement	: 7-12.5 ft. BLS
Sand pack type	: 8/16 Oglebay silica
Sand volume	: 9 bags
Sand placement	: 12.5-25 ft. BLS
Lower Annular seal	: 5 bg powder, hydrated
Seal placement	: 26.5-40 BLS

ELEVATIONS

Ground elevation	: Approx. 4035 ft.
Inner casing, top	: - -

WELL INSTALLATION:
Drilled to 40 feet with 8 1/4" auger to determine lithology. Backfilled to 25 ft. and installed well with 10 ft. screen. 5 bags bentonite powder to 26.5 ft., 1.5 bags 8/16 Oglebay-Norton sand to 25 ft., 7.5 bags to 12.5 ft, 3 bags Aquagel bentonite powder to 7 ft., hydrated. QuikCrete cement mix to surface. Installed locking steel protection casing, stick-up approximatel 3.2 ft. above land surface. Water at 24.86 BTC.

WELL DEVELOPMENT:
On 05/29/05 measured DTW at 24.49 ft. BTC. Pumped out approximately 2.5 gallons and collected water sample.

On 06/03/05 measured water at 24.56 ft. and pumped 1.5 gallon until dry.

Notes:
Location south side of service road opposite SE corner of landfarm Cell 6.

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LOG OF BORING BH-3

Groundwater Investigation
Artesia Aeration
Maljamar, New Mexico
N1/2, Section 7, T17S, R32E

Date, Time Started:	: 06/29/05; 1100	Drilled By:	: Eco/Enviro Drilling
Date, Time Completed	: 06/29/05; - -	Logged By:	: D.G. Boyer, SESI
Hole Diameter:	: 8 1/4"	Northing Coordinate	:
Drilling Method:	: Hollow Stem Auger	Easting Coordinate	:
Drilling Equipment:	: Foremost-Mobile B-57	Survey By	:

Sample Type:
SS Split Spoon (18 in. or 24 in.)
CB Core Barrel (5 ft.)
CT Auger Cuttings
NR No recovery

Depth in Feet	Sample Type	Recovery (ft.)	USCS	GRAPHIC	DESCRIPTION
0	CB	1.4	SP		0-5 ft. SAND, reddish brown, very fine grained, approx. 1 in. caliche and sand at 5 ft., chalk color
5					5-5.8 ft. SAND, reddish brown, very fine grained
			CA		5.8-7 ft. CALICHE, chalk-color with brown inclusions, soft
	CB	5	SP		7-10 ft. SAND with caliche fragments, chalk color, very fine grained, soft caliche, dry
10					10-10.5 ft. SAND, very light brown, with sandstone "cookies"
			SW		10.5-12 ft. GRAVELLY SAND, sand very light brown, very fine to fine grained, gravels are granitic to 3/4 in.
	CB	3.8	SP		12-13.5 ft. SAND, brown, very fine grained, granitic gravels at 13.5 ft.
			SS		13.5-13.7 ft. SANDSTONE, poorly cemented, dry
15			SS/SL		15-17.3 ft. SANDSTONE/SILTSTONE, poorly consolidated and poorly cemented.
	CB	2.7	SP		17.3-17.5 ft. SAND, light brown, very fine grained, dry
20	CB	NR	- -		20-25 ft. No recovery, nothing in core or on tip, dry core barrel
25			SS/SL		25-26 ft. SANDSTONE/SILTSTONE, light brown, very fine grained, hard.
	CB	3.7	CL		26-28.7 ft. Red-bed CLAY, reddish-brown, very stiff, very dry
30					

Notes:
Location 65 ft. south of MW-2 between MW-2 and water pipeline. Backfilled with 10 bags 3/8 in. Holeplug bentonite chips, hydrated.

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LOG OF BORING BH-4

Groundwater Investigation
Artesia Aeration
Maljamar, New Mexico
N1/2, Section 7, T17S, R32E

Date, Time Started:	: 06/29/05; - -	Drilled By:	: Eco/Enviro Drilling
Date, Time Completed	: 06/29/05; 1630	Logged By:	: D.G. Boyer, SESI
Hole Diameter:	: 8 1/4"	Northing Coordinate	:
Drilling Method:	: Hollow Stem Auger	Easting Coordinate	:
Drilling Equipment:	: Foremost-Mobile B-57	Survey By	:

Sample Type:
SS Split Spoon (18 in. or 24 in.)
CB Core Barrel (5 ft.)
CT Auger Cuttings
NR No recovery

Depth in Feet	Sample Type	Recovery (ft.)	USCS	GRAPHIC	DESCRIPTION
0	CB	2	AR		0-1.7 Fill material (rock, sand), damp
			SP		1.7-2 ft. SAND, brown, very fine to fine grained, damp
5			SC		5-5.4 ft. CLAYEY SAND, reddish-brown, slightly damp
			CA/CL		5.4-6.6 ft. CALICHE (soft), chalk color and sandy clay, brown
	CB	5	CA		6.6-8.0 ft. CALICHE, sandy (or caliche sand) soft, very light brown,
			SP		8.0-10.0 ft. SAND, limey sand grading to brown sand, very fine grained, dry core
10					10-12.6 ft. SAND, brown, very fine grained
	CB	3.8			12.6-13.8 ft. SAND, limey, chalk white, very fine grained, silty, powdery in spots, Hard chert/sandstone rock at base (15 ft.), dry core
15					15-16.2 ft. SAND, very light brown, very fine grained, limey, dry
	CB	2.2	SP/SS		16.2 ft. SANDSTONE rock at 16.2 ft., hard, well cemented 16.2-17.2 ft. SAND and SANDSTONE, sand limey, very fine grained, sandstone consolidated but poorly cemented, dry
20			SS/SP		20-21.9 ft. SANDSTONE and SAND, sandstone poorly consolidated, medium cementing; sand brown, very fine grained, dry
	CB	4.2	CL		21.9-24.2 ft. Redbed CLAY, brown, very stiff, very dry
25					
	CB	3.2	CL		25-28.2 ft. SANDY CLAY with some clayey sand, redbeds, hard, competent sandstone, rock in tip, dry.
30					

Notes:
Located in northern 2/3 center of Cell 5. Backfilled with 13 bags 3/8 in. Holeplug bentonite chips, hydrated.

Z:\SESCentral\Company Files\Artesia Aeration\Boring-well Logs\BH-4.BOR

Jones, Brad A., EMNRD

From: Jones, Brad A., EMNRD
Sent: Wednesday, October 17, 2007 4:29 PM
To: 'David Boyer'
Cc: Jim Wilson; Price, Wayne, EMNRD
Subject: RE: Artesia Aeration -- Change in Monitor Well Depth

Jim and David,

I will attach this email to the October 11, 2007 monitoring well installation work plan and accept it as an official revision. The Oil Conservation Division (OCD) has reviewed the attached document and determined that the October 11, 2007 proposal with this revision (to increase the final depth of the well to 160 feet) is adequate to proceed with the site investigation. It should be understood that if a monitoring well is constructed, it shall be bailed until fully developed. Please provide directions to the proposed site and a confirmed start time and date for the drilling activities. OCD representatives will be present prior to any drilling for confirmation of the proposed drilling location of MW-3.

Brad

Brad A. Jones
Environmental Engineer
Environmental Bureau
NM Oil Conservation Division
1220 S. St. Francis Drive
Santa Fe, New Mexico 87505
E-mail: brad.a.jones@state.nm.us
Office: (505) 476-3487
Fax: (505) 476-3462

From: David Boyer [mailto:dgboyer@sesi-nm.com]
Sent: Wednesday, October 17, 2007 4:11 PM
To: Jones, Brad A., EMNRD
Cc: Jim Wilson
Subject: Artesia Aeration -- Change in Monitor Well Depth

Brad,

Jim Wilson just called and per your request we are increasing the final depth of the monitor well to 160 ft. We are sending you a correction to work plan that reflects that change. Please make the change in your current work plan.

We are preparing to drill the monitor well on Tuesday, October 30 and will stop at the depth specified in the work plan to observe if shallow water enters the borehole. Please let us know the anticipated time of your arrival at the job site.

Thank you for your prompt review of the work plan,

David G. Boyer, P.G.
Hydrogeologist
Safety and Environmental Solutions, Inc.
P.O. Box 1613
703 E. Clinton, Suite #102
Hobbs, NM 88241
office 505-397-0510
fax 505-393-4388
cell 505-390-7067
email dgboyer@sesi-nm.com

sesiFile

P.O. Box 1613
703 E. Clinton Suite 102
Hobbs, New Mexico 88240
505/397-0510
FAX 505/393-4388
www.sesi-nm.com

Safety & Environmental Solutions, Inc.

October 11, 2007

Mr. Brad A. Jones
Environmental Engineer
New Mexico Oil Conservation Division
1220 South St. Francis Drive
Santa Fe, New Mexico 87505

Subject: Artesia Aeration Monitoring Well Installation/Work Plan, July 26, 2007
Request for Additional Information
Artesia Aeration Landfarm: Permit NM-01-0030
Location: Section 7, Township 17 South, Range 32 East, NMPM
Lea County, New Mexico

Dear Mr. Jones:

This letter is in response to your letter of August 6, 2007 and subsequent telephone discussions providing comments on the work plan. You requested that we provide additional information before performing additional site characterization and investigative work, including drilling and installing of additional boreholes or monitor wells.

Specifically you requested submittal of a revised boring plan that addresses the recommendations provided in the letter including the method of drilling, the plan to continuously core, proposed construction design details of the monitoring well, procedures to determine if groundwater is present and a surveyed site map showing the proposed boring location. A revised work plan addressing the comments was provided to your office on September 28, 2007.

The current work plan, dated October 11, 2007 and enclosed with this letter, addresses remaining comments discussed last week in a telephone conversation. Specially, the changes included moving the proposed location of MW-3 to northwest of the proposed expansion area, waiting a minimum of 18 hours (overnight) to see if water enters the borehole at the elevation seen in MW-2 and assuming the maximum depth of a lined pit may exceed 25 ft. due to installation/design issues

Following your review and our addressing any further concerns you may have, and subsequent to OCD approval, we will set a drilling date and provide you with a 14-day notification of that date so that a representative of the agency can be present to witness the work.

If you have any questions, please contact me at (505) 397-0510.

Sincerely,

David G. Boyer, P.G.

Cc. Jim Wilson, Artesia Aeration
OCD District I Office, Hobbs

V. Action Plan

The following action plan for the location and construction of the proposed monitor well is presented below. A diagram of the proposed well is shown as Figure 4.

1. The proposed site of the new monitor well, identified as MW-3, will be in the northwest area of the facility just to the west and outside of the proposed expansion area. The proposed location is shown on Figure 2. An elevated pad and access road will be constructed to the site and the well will be elevated above the surrounding surface. It will be marked and New Mexico One-Call will be contacted to provide buried line identification within a radius of 50 ft. of the proposed drill location.

2. The proposed monitor well (MW-3) will be drilled to a depth of 160 ft. below land surface (BLS). This depth was determined in the following manner. At the location of the proposed well, the surface elevation is approximately 4,017 ft. above mean sea level (Figure 2). We expect a well pad will be constructed at the location which might be as much as 4 to 5 ft. above the existing land surface making the ground elevation at the location as much as 4,022 ft.

   We have not prepared, nor is it necessary to prepare, detailed drawings of the pits at this stage of the investigation where we are determining the suitability of the site for its intended use. Knowing the extent of the pit area and maximum depth of the pits is sufficient to determine a drilling and monitor well target depth. For this submittal, it was determined as follows: The surface elevation of any proposed pit furthermost from and topographically downgradient from the proposed well is just over 4,000 ft. The maximum planned depth of the pits including liners and the leak detection system will be 25 ft. However, to allow for possible installation issues, a maximum depth of 35 ft. will be used for determination of the drilling depth. A depth 100 ft. below the maximum depth will be at an elevation of 4,000 ft. minus 35 ft. minus 100 ft., or 3,865 ft. below land surface (BLS). The difference in elevation between that at the proposed well pad location (4,022 ft.) and 3,865 ft. is 157 ft. As coring is performed in 5 ft. intervals, the maximum depth of the boring/well is proposed to be 160 ft.

3. The drilling equipment to be used will be a hollow-stem auger with a five-foot splitspoon core barrel for collection and examination of lithologic samples. The core barrel will be advanced and samples will be taken continuously from the surface to total depth in five-foot intervals. Detailed geologic logs will be maintained for each well. The picture in Figure 3, from an unrelated location, shows a typical recovery core using this method. Changes in lithology, color, grain size, etc. are easily logged using this method of sample recovery. The monitor well and boring information provided in the appendix was collected using this method of sampling.

4. The drilling and coring shall continue until the water bearing zone encountered in MW-2 is reached. This is expected to be at a depth of about 30-35 ft. based on the difference in elevation between the two locations and factoring in a pad elevation of 4-5 ft. above the land surface. It will also likely be at or close to the contact of the alluvial sand and the underlying clay redbeds. When this depth is reached, drilling will cease and a temporary screen and casing installed. We will wait a minimum of 18 hours (i.e. overnight) for water, if present to enter the casing. If water is present and following consultation with the OCD, the temporary well will be re-completed as a shallow 2-inch diameter monitor well with ten feet of screen and to the installation specifications as described in #5 below.

5. If no water is encountered, drilling will continue as described in this section. The deep well will be completed as a 2-inch diameter monitor well with ten feet of screen, a sand filter pack two feet above the top of the screen, a two-foot bentonite seal (hydrated), and with a bentonite-cement grout to the surface. Surface completion will be a steel, above ground protection casing with a locking cap and a cement pad. An example of a monitor well with these construction details is shown in Figure 4.
6. If water is encountered in the shallow borehole and following consultation with OCD, a second boring will be drilled to the original target depth of 160 ft. using the following methodology. A 10 or 12 in. string of steel surface casing will be installed several feet into the dry clay redbeds and cemented back to the surface. We expect to use a local anchor drilling company to bore the hole and our driller will install and cement the casing. Following cement setup, we will drill through the bottom of the surface casing and continue coring as described above. The second well will be completed as described in #5 above.
7. OCD will be notified at least 14-days in advance of the drilling so that an OCD representative can make the necessary arrangements to be present at the site during the drilling and installation of the monitor well.
8. Following completion of the well, a drilling log, well installation log and narrative report will be completed and submitted to Artesia Aeration, NM OCD and the NM State Engineer Office. Water level measurements and water quality sampling will be performed on a frequency and for constituents as required by the NM OCD.

VI. References

Ash, S.R., 1963. Ground-water conditions in northern Lea County, New Mexico: U.S. Geological Survey, Hydrologic Investigations Atlas, HA-62, 2 plates.

Nicholson, A. Jr., and Clebsch, A. Jr., 1961. Geology and ground-water conditions in southern Lea County, New Mexico: N. Mexico Institute of Mining and Technology, State Bureau of Mines and Mineral Resources Ground Water Report #6, 123 p.

Work Plan
Artesia Aeration
Monitor Well Installation
Section 7, Township 17S, Range 32E
Lea County, New Mexico

Revised October 11, 2007

Prepared for:

Artesia Aeration
5614 Lovington Highway
Hobbs, NM 88240

By:

Safety & Environmental Solutions, Inc.
703 E. Clinton Suite 102
Hobbs, New Mexico 88240
(505) 397-0510

TABLE OF CONTENTS

I. Company/Agency Contacts

Name	Company	Telephone	e-mail
Jim Wilson	Artesia Aeration	505-746-9862 (o) 505-703-8383 (c)	marlaena@valornet.com
David Boyer, P.G.	SESI	505-397-0510 (o) 505-390-7067 (c)	dgboyer@sesi-nm.com

II. Purpose

The purpose of this work plan is to propose drilling and construction details of a ground water monitor well at the Artesia Aeration facility, which is located in Section 7, Township 17S, Range 32E, Eddy County, New Mexico. The facility location is located on private land approximately two miles west of the unincorporated community of Maljamar and is adjacent to and on the north side of US Highway 82. The location of the facility is shown in Figure 1.

III. Background

Artesia Aeration is an NM Oil Conservation Division (OCD) facility approved for the land farm remediation of hydrocarbon-contaminated soil resulting from current and past spills, leaks or other releases of petroleum hydrocarbon associated with the drilling and production of oil and natural gas. The facility desires to receive for long term encapsulation salt-contaminated soil resulting from produced water spills and leaks from said operations and is preparing an application for submittal to the OCD. The salt contaminated material will be placed in lined pits with a maximum depth, including liners, of 25 ft. beneath the land surface. The maximum area within the facility where such proposed pits may be located is shown on Figure 2, the topographic survey, as "Proposed Expansion Area".

As part of the application, Artesia Aeration will provide the OCD with information on groundwater, or lack thereof, in the vicinity of the proposed disposal pits. Safety and Environmental Solutions, Inc., has been engaged to supervise drilling and installation of a deep monitor well and will collect lithologic core samples and provide a report on the findings.

IV. Groundwater

Groundwater is generally absent in the area to the west of the Ogallala caprock at Maljamar. The lack of potable groundwater west of the caprock has been documented in several reports by the NM Bureau of Mines and the US Geological Survey (see Section VI, References).

There are three existing monitor wells on the property. Two are dry, including one drilled to a depth of 120 ft. located near the entrance to the property (see Figure 2, the topographic survey, showing the location of that well, MW-D1). The third well (MW-2) is located at the south end of, and between, cells 5 and 6. The well is adjacent to the Highway 82 bar ditch and shows a very thin saturated zone on top of red bed clays that is thought to be due to infiltration from intermittent ponded water in the ditch. Well construction information and water level measurement history is submitted in the Appendix and as Table 1, respectively. Updated information on all current and proposed wells will be submitted with the disposal application.

V. Action Plan

The following action plan for the location and construction of the proposed monitor well is presented below. A diagram of the proposed well is shown as Figure 4.

1. The proposed site of the new monitor well, identified as MW-3, will be in the northwest area of the facility just to the west and outside of the proposed expansion area. The proposed location is shown on Figure 2. An elevated pad and access road will be constructed to the site and the well will be elevated above the surrounding surface. It will be marked and New Mexico One-Call will be contacted to provide buried line identification within a radius of 50 ft. of the proposed drill location.

2. The proposed monitor well (MW-3) will be drilled to a depth of 160 ft. below land surface (BLS). This depth was determined in the following manner. At the location of the proposed well, the surface elevation is approximately 4,017 ft. above mean sea level (Figure 2). We expect a well pad will be constructed at the location which might be as much as 4 to 5 ft. above the existing land surface making the ground elevation at the location as much as 4,022 ft.

   We have not prepared, nor is it necessary to prepare, detailed drawings of the pits at this stage of the investigation where we are determining the suitability of the site for its intended use. Knowing the extent of the pit area and maximum depth of the pits is sufficient to determine a drilling and monitor well target depth. For this submittal, it was determined as follows: The surface elevation of any proposed pit furthermost from and topographically downgradient from the proposed well is just over 4,000 ft. The maximum planned depth of the pits including liners and the leak detection system will be 25 ft. However, to allow for possible installation issues, a maximum depth of 35 ft. will be used for determination of the drilling depth. A depth 100 ft. below the maximum depth will be at an elevation of 4,000 ft. minus 35 ft. minus 100 ft., or 3,865 ft. below land surface (BLS). The difference in elevation between that at the proposed well pad location (4,022 ft.) and 3,865 ft. is 157 ft. As coring is performed in 5 ft. intervals, the maximum depth of the boring/well is proposed to be 160 ft.

3. The drilling equipment to be used will be a hollow-stem auger with a five-foot splitspoon core barrel for collection and examination of lithologic samples. The core barrel will be advanced and samples will be taken continuously from the surface to total depth in five-foot intervals. Detailed geologic logs will be maintained for each well. The picture in Figure 3, from an unrelated location, shows a typical recovery core using this method. Changes in lithology, color, grain size, etc. are easily logged using this method of sample recovery. The monitor well and boring information provided in the appendix was collected using this method of sampling.

4. The drilling and coring shall continue until the water bearing zone encountered in MW-2 is reached. This is expected to be at a depth of about 30-35 ft. based on the difference in elevation between the two locations and factoring in a pad elevation of 4-5 ft. above the land surface. It will also likely be at or close to the contact of the alluvial sand and the underlying clay redbeds. When this depth is reached, drilling will cease and a temporary screen and casing installed. We will wait a minimum of 18 hours (i.e. overnight) for water, if present to enter the casing. If water is present and following consultation with the OCD, the temporary well will be re-completed as a shallow 2-inch diameter monitor well with ten feet of screen and to the installation specifications as described in #5 below.

5. If no water is encountered, drilling will continue as described in this section. The deep well will be completed as a 2-inch diameter monitor well with ten feet of screen, a sand filter pack two feet above the top of the screen, a two-foot bentonite seal (hydrated), and with a bentonite-cement grout to the surface. Surface completion will be a steel, above ground protection casing with a locking cap and a cement pad. An example of a monitor well with these construction details is shown in Figure 4.
6. If water is encountered in the shallow borehole and following consultation with OCD, a second boring will be drilled to the original target depth of 160 ft. using the following methodology. A 10 or 12 in. string of steel surface casing will be installed several feet into the dry clay redbeds and cemented back to the surface. We expect to use a local anchor drilling company to bore the hole and our driller will install and cement the casing. Following cement setup, we will drill through the bottom of the surface casing and continue coring as described above. The second well will be completed as described in #5 above.
7. OCD will be notified at least 14-days in advance of the drilling so that an OCD representative can make the necessary arrangements to be present at the site during the drilling and installation of the monitor well.
8. Following completion of the well, a drilling log, well installation log and narrative report will be completed and submitted to Artesia Aeration, NM OCD and the NM State Engineer Office. Water level measurements and water quality sampling will be performed on a frequency and for constituents as required by the NM OCD.

VI. References

Ash, S.R., 1963. Ground-water conditions in northern Lea County, New Mexico: U.S. Geological Survey, Hydrologic Investigations Atlas, HA-62, 2 plates.

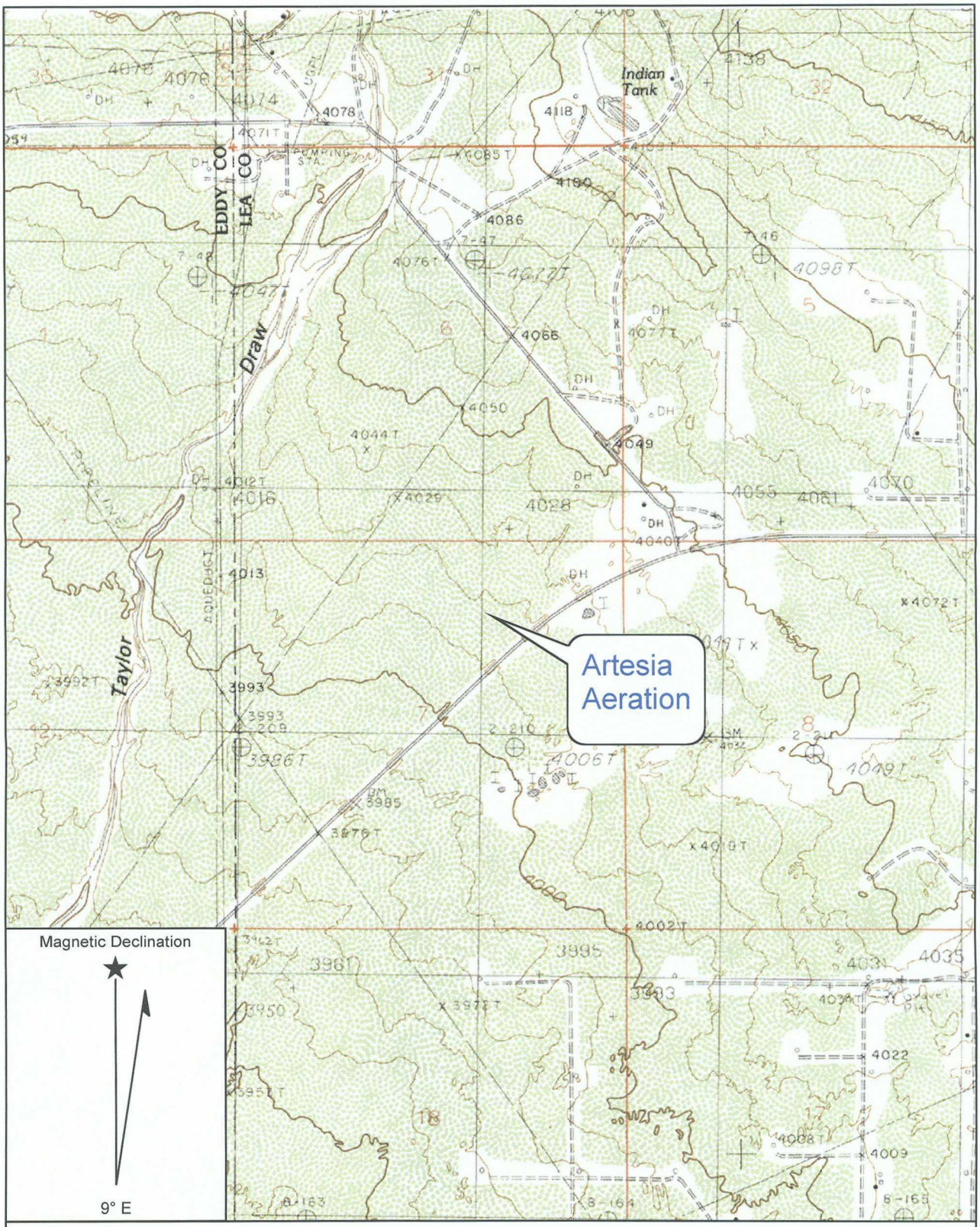
Nicholson, A. Jr., and Clebsch, A. Jr., 1961. Geology and ground-water conditions in southern Lea County, New Mexico: N. Mexico Institute of Mining and Technology, State Bureau of Mines and Mineral Resources Ground Water Report #6, 123 p.

VII. Work Plan Table and Figures

Table 1. Water Level Measurements, Artesia Aeration, Lea County, New Mexico

Monitor Well Name, Total Depth Below TOC (feet)	Elevation Top of Casing (feet)	Ground Level Elevation (feet), Note	Date Measured	Depth to Water Below TOC (feet)	Water Level Elev. (feet)	Water Saturated Thickness (feet)	Water Level Change (ft)
MW-1	4,036.21	4,032.91	05/21/05	Dry	- -	- -	- -
28.02			06/01/05	Dry	- -	- -	- -
			06/03/05	Dry	- -	- -	- -
			06/08/05	Dry	- -	- -	- -
			06/29/05	Dry	- -	- -	- -
			07/12/05	Dry	- -	- -	- -
			07/14/05	Dry	- -	- -	- -
			07/22/05	Dry	- -	- -	- -
			07/26/05	Dry	- -	- -	- -
			08/02/05	Dry	- -	- -	- -
			08/05/05	Dry	- -	- -	- -
			08/09/05	Dry	- -	- -	- -
			12/15/05	Dry	- -	- -	- -
			08/13/07	Dry	- -	- -	- -
MW-2	4,015.60	4,012.42	05/29/05	24.49	3,991.11	3.8	- -
28.32		*	06/01/05	24.59	3,991.01	3.7	-0.10
		*	06/03/05	24.56	3,991.04	3.8	0.03
		*	06/08/05	24.66	3,990.94	3.7	-0.10
		*, 10:30 am	06/29/05	24.97	3,990.63	3.4	-0.31
		*, 3:45 pm	06/29/05	25.24	3,990.36	3.1	-0.27
		*	07/12/05	25.22	3,990.38	3.1	0.02
		*	07/14/05	25.24	3,990.36	3.1	-0.02
		*	07/22/05	25.39	3,990.21	2.9	-0.15
		*	07/26/05	25.43	3,990.17	2.9	-0.04
		*	08/02/05	21.60	3,994.00	6.7	3.83
		*	08/05/05	21.07	3,994.53	7.3	0.53
		*	08/09/05	21.01	3,994.59	7.3	0.06
			12/15/05	23.33	3,992.27	5.0	-2.32
		*	08/13/07	24.35	3,991.25	4.0	-1.02
MW-3	- -		Not drilled	- -	- -	- -	- -
- -							
MW-D1	4,037.08	4,032.40	05/13/99	Dry	- -	- -	- -
124.68			05/21/05	Dry	- -	- -	- -
			08/13/07	Dry - unable to determine total depth			- -
Locations surveyed 08/08/07							
* - Pumped dry after measurement							

Figure 1. Location Map, Artesia Aeration, Lea County, New Mexico

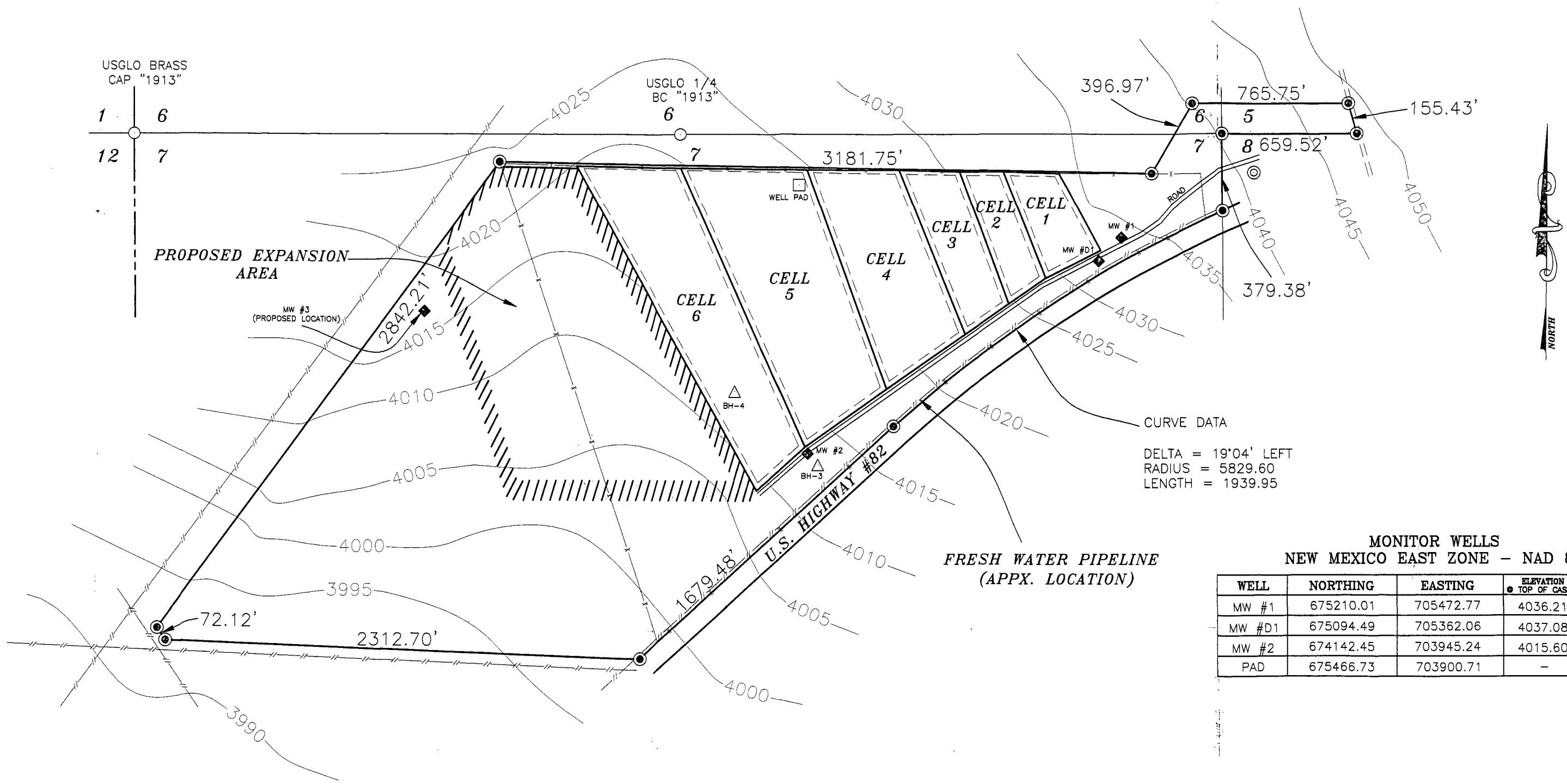


Name: MALJAMAR
Date: 10/17/2007
Scale: 1 inch equals 2000 feet

Location: 032° 51.2150' N 103° 48.1947' W NAD 83
Caption: Figure 1. Location Map, Artesia Aeration, Lea County, New Mexico

Figure 2. Topographic Survey, Artesia Aeration
Lea County, New Mexico

TOPOGRAPHIC SURVEY OF ARTESIA AERATION LLC LAND FARM IN SECTIONS 5, 6, & 7, TOWNSHIP 17 SOUTH, RANGE 32 EAST, N.M.P.M., LEA COUNTY, NEW MEXICO



MONITOR WELLS
NEW MEXICO EAST ZONE – NAD 83

WELL	NORTHING	EASTING	ELEVATION @ TOP OF CASING	GROUND ELEVATION
MW #1	675210.01	705472.77	4036.21'	4032.91'
MW #D1	675094.49	705362.06	4037.08'	4032.40'
MW #2	674142.45	703945.24	4015.60'	4012.42'
PAD	675466.73	703900.71	–	4028.37'

NOTES:
HORIZONTAL COORDINATES WERE ESTABLISHED BY USING GPS (GLOBAL POSITIONING SYSTEM). AND ARE NEW MEXICO EAST ZONE, NAD 83, U.S. SURVEY FEET VALUES.

ELEVATIONS WERE ESTABLISHED BY CONVENTIONAL LEVELING BASED OFF MONUMENT "WILSON", ELEVATION OF 4042.99' (NAVD 88).

TERRY J. ASEL
NEW MEXICO
15079
REGISTERED PROFESSIONAL SURVEYOR

ORS CERTIFICATE

I ASEL, NEW MEXICO PROFESSIONAL SURVEYOR
DO HEREBY CERTIFY THAT I CONDUCTED AND AM
BLE FOR THIS SURVEY, THAT THIS SURVEY IS TRUE
RECT TO THE BEST OF MY KNOWLEDGE AND BELIEF,
S THE "MINIMUM STANDARDS FOR SURVEYING IN
CO" AS ADOPTED BY THE NEW MEXICO STATE
REGISTRATION FOR PROFESSIONAL ENGINEERS
EYORS.

10/12/2007

sel N.M. R.P.S. No. 15079

LEGEND

◆ – DENOTES MONITOR WELL
△ – DENOTES BORE HOLE
◉ – DENOTES PROPERTY CORNER
◎ – DENOTES SET 1/2" REBAR W/PVC CAP MARKED ASEL CONTROL PT. (WILSON) BENCHMARK FOR ELEVATIONS

Asel Surveying
& Consulting

P.O. BOX 393 – 310 W. TAYLOR
HOBBS, NEW MEXICO – 505-393-9146

500' 0 500' 1000' FEET
SCALE: 1"=500'

ARTESIA AERATION LLC

TOPOGRAPHIC SURVEY OF ARTESIA AERATION LLC LAND FARM IN SECTIONS 5, 6, & 7, TOWNSHIP 17 SOUTH, RANGE 32 EAST, N.M.P.M., LEA COUNTY, NEW MEXICO.

Survey Date: 08/08/2007	W.O. Number: 070808MW-REV.B
	File: 070808MW-REV.B.DWG
Date: 10/09/2007	Drafted By: KA

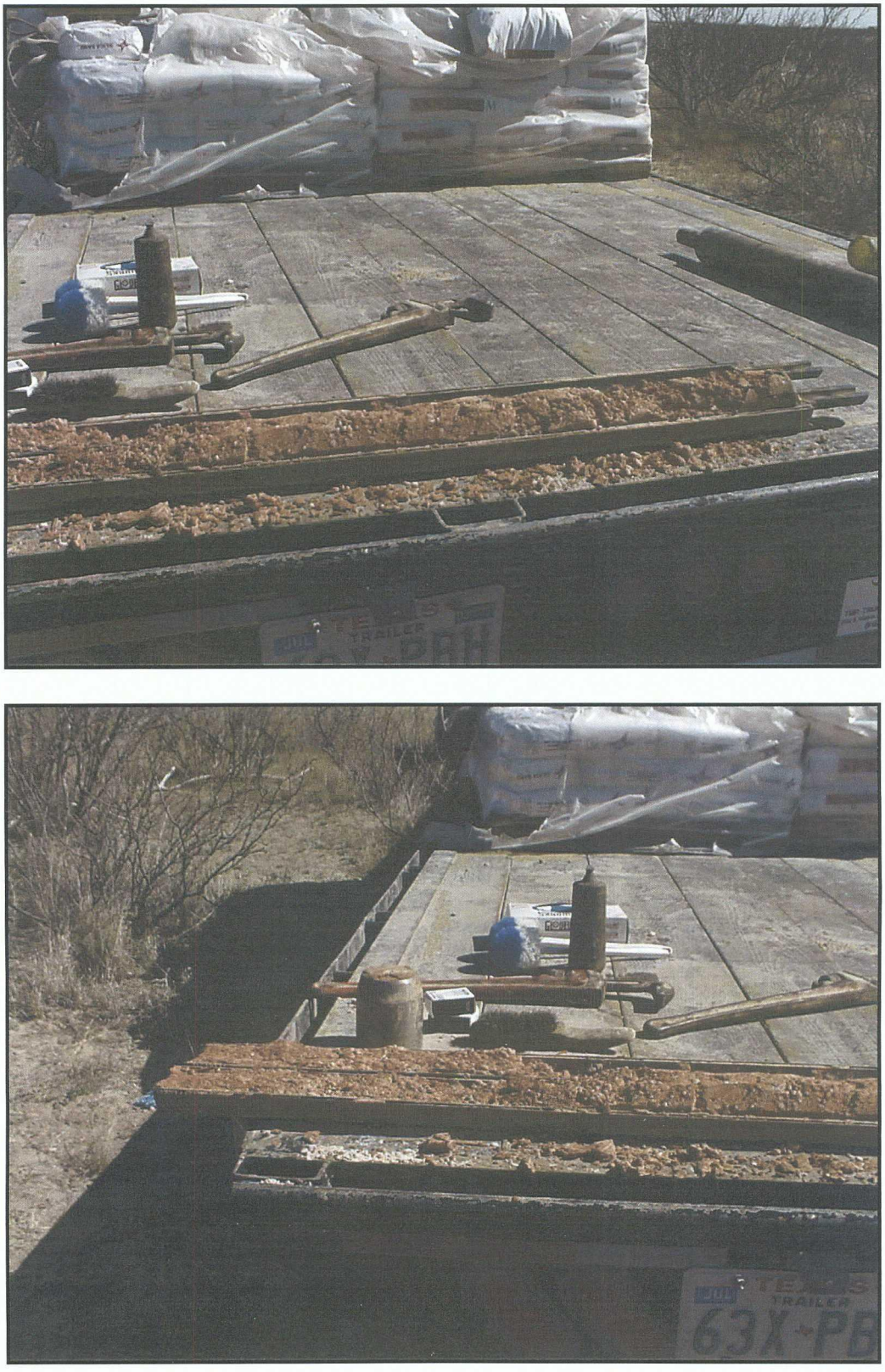


Figure 3. Example of five-foot core barrel sampling method (from an unrelated location)

Figure 4. Diagram of Proposed Monitor Well Construction

EXAMPLE LOG OF PROPOSED WELL

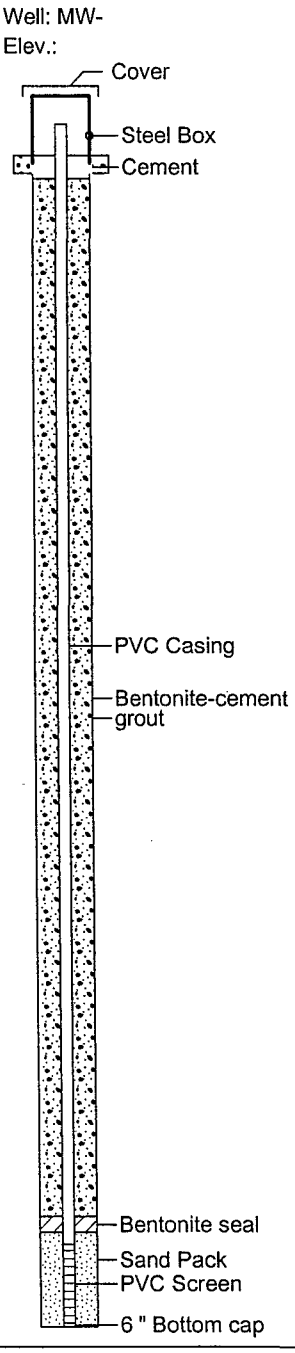
(Page 1 of 1)

Groundwater Investigation
Artesia Aeration
Maljamar, New Mexico
N1/2, Section 7, T17S, R32E

Date, Time Started:	:	Drilled By:	: Eco/Enviro Drilling
Date, Time Completed	:	Logged By:	: D.G. Boyer
Hole Diameter:	: 8 1/4"	Northing Coordinate	:
Drilling Method:	: Hollow Stem Auger	Easting Coordinate	:
Drilling Equipment:	: Foremost-Mobile B-57	Survey By	:

Sample Type:
SS Split Spoon (18" or 24")
CB Core Barrel (2' or 5')
CT Auger Cuttings
NR No recovery

Depth in Feet	Sample Type	USCS	GRAPHIC	DESCRIPTION
0–25	CB	SP		0-25 ft. SAND
25–40	CB	CL		25-40 ft. CLAY, green
40–100	CB	CL/CA		40-100 ft. Red CLAY and CALICHE
100–110	CB	CA		100-110 ft. CALICHE
110–120	CB	CL		110-120 ft. CLAY, Red and Green
120–150	CB	??		120-150 ft. (Unknown)



Well Construction Information

COMPLETION DATA

Hole Depth	: 150 ft. Below LS
TD Inside casing	: 154 ft. Below TOC

CASING, SCREEN & CAP

Material, joints	: PVC, threaded
Diameter	: 2 in. ID
Manufacturer	: LAIBE
Screen type	: Slotted
Screen length	: 10 ft.
Screen opening	: 0.020 slot
Scrn. placement	: 140-150 ft. BLS
Sump	: None
Bottom Cap	: 0.5 ft PVC
Protector Casing	: Steel box
Lock Key #	: - -

SEALS & SAND PACK

Cement seal type	: Concrete
Cem't placement	: 0 - 3 ft. BLS
Grout placement	: - -
Annular seal type	: Bentonite chips
Seal volume	: __ bags, hydrated
Seal placement	: 3-138 ft. BLS
Sand pack type	: 8/16 Oglebay silica
Sand volume	: __ bags
Sand placement	: 138-150 ft. BLS
Lower Annular seal	: - -
Seal placement	: - -

ELEVATIONS

Ground elevation	: Approx. 4025 ft.
Inner casing, top	: - -

WELL INSTALLATION:
Drilled to 150 feet with 8 1/4" auger to determine lithology. Installed well with 10 ft. screen. __ bags 8/16 Oglebay-Norton sand to 138 ft., __ bags bentonite chips to 3 ft., hydrated. Cement mix to surface. Installed locking steel protection casing, stick-up approximatel 4 ft.

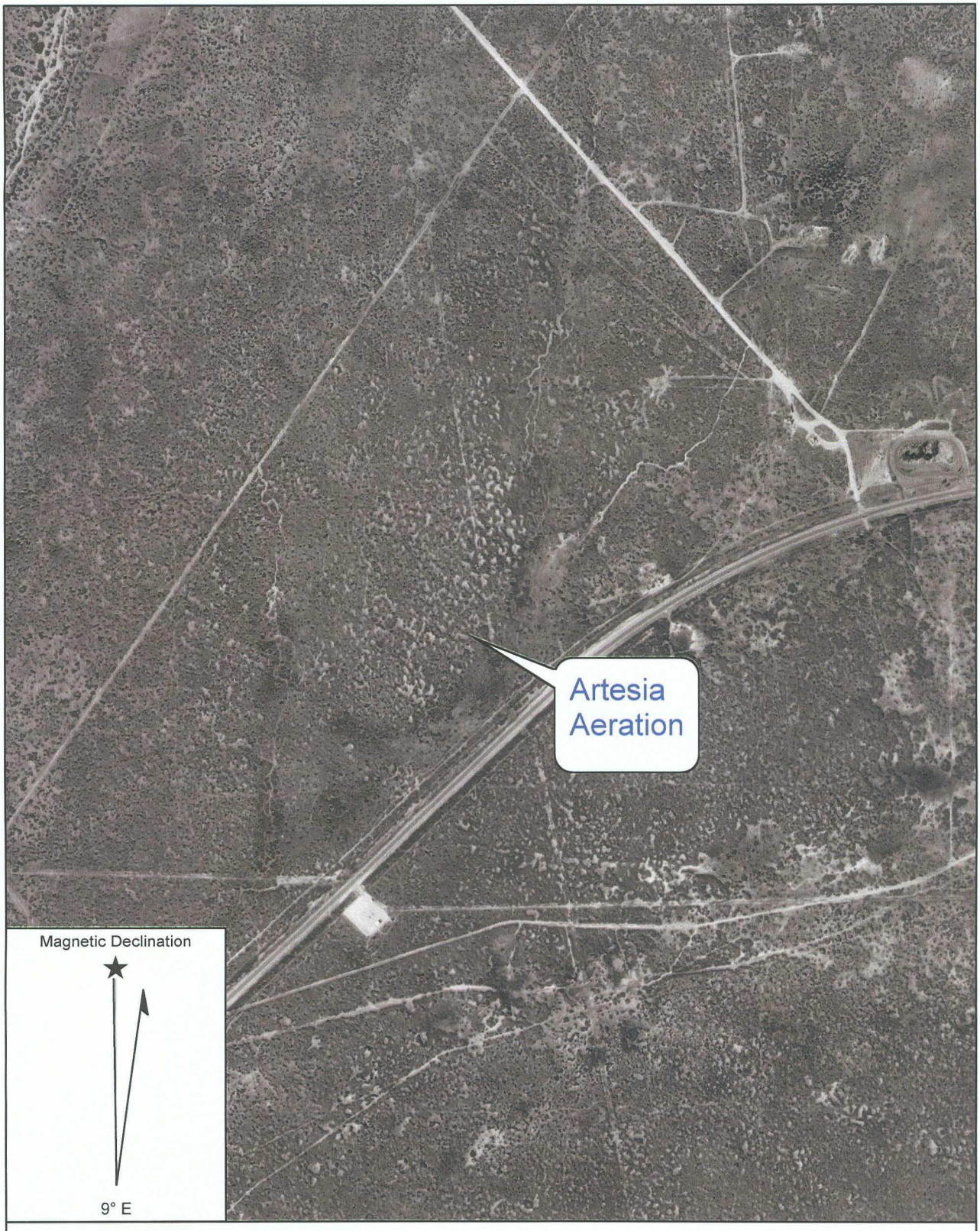
WELL DEVELOPMENT:

Notes:
Location northeast corner cell 5.
Sample lithology taken from existing deep well drilled to 120 ft. in 1999.

\\Sescentral\ie\SESCentral\Company Files\Artesia Aeration\ARA-07-001 2007 Monitor Well and Plan\Proposed Deep Mon Well.BOR

VIII. Appendix - Supporting Information:

- **USGS Aerial Photograph (1996)**
- **Borehole/Monitor Well Logs**



Name: MALJAMAR NE, NM
Date: 10/11/2007
Scale: 1 inch equals 1000 feet

Location: 032° 51.2475' N 103° 48.1845' W NAD 83
Caption: Aerial Photograph, Artesia Aeration, Lea County, New Mexico (October, 1996)

Revised June 1972

STATE ENGINEER OFFICE

WELL RECORD

Section 1. GENERAL INFORMATION

(A) Owner of well Artesia Aeration LLC Owner's Well No. _____

Street or Post Office Address P.O. Box 248

City and State Artesia N.M. 88210

Well was drilled under Permit No. _____ and is located in the:

a. _____ ¼ _____ ¼ _____ ¼ _____ ¼ of Section _____ Township _____ Range _____ N.M.P.M.

b. Tract No. _____ of Map No. _____ of the _____

c. Lot No. _____ of Block No. _____ of the _____
Subdivision, recorded in Lea County.

d. X= _____ feet, Y= _____ feet, N.M. Coordinate System _____ Zone in the _____ Grant.

(B) Drilling Contractor C&R DRILLING License No. 763

Address 7217 ROSWELL HWY. ARTESIA N.M. 88210

Drilling Began 5-12-99 Completed 5-13-99 Type tools Rotary Size of hole 7½ in.

Elevation of land surface or _____ at well is _____ ft. Total depth of well 120 ft.

Completed well is ☒ shallow ☐ artesian. Depth to water upon completion of well 0 ft.

Section 2. PRINCIPAL WATER-BEARING STRATA

Depth in Feet From	Depth in Feet To	Thickness in Feet	Description of Water-Bearing Formation	Estimated Yield (gallons per minute)

Section 3. RECORD OF CASING

Diameter (inches)	Pounds per foot	Threads per in.	Depth in Feet Top	Depth in Feet Bottom	Length (feet)	Type of Shoe	Perforations From	Perforations To

Section 4. RECORD OF MUDDING AND CEMENTING

Depth in Feet From	Depth in Feet To	Hole Diameter	Sacks of Mud	Cubic Feet of Cement	Method of Placement
0	20	7½"	1qel		By hand

Section 6. LOG OF HOLE

Depth in Feet From	Depth in Feet To	Thickness in Feet	Color and Type of Material Encountered
0	25	25	Sand
25	40	15	Green clay
40	110	60	Red clay & caliche
110	110	10	Caliche
110	120	10	Red clay & green clay

Section 7. REMARKS AND ADDITIONAL INFORMATION

Monitaring Hole

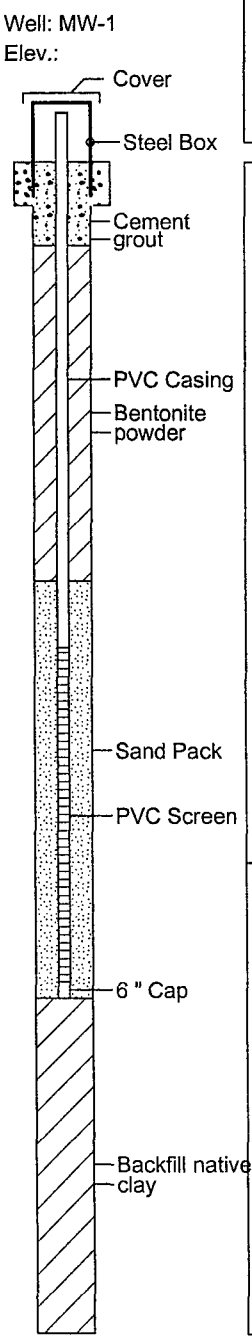
LOG OF WELL MW-1

Groundwater Investigation
Artesia Aeration
Maljamar, New Mexico
N1/2, Section 7, T17S, R32E

Date, Time Started:	: 05/14/05; 0900	Drilled By:	: Eco/Enviro Drilling
Date, Time Completed	: 05/14/05; 1430	Logged By:	: D.G. Boyer, SESI
Hole Diameter:	: 8 1/4"	Northing Coordinate	:
Drilling Method:	: Hollow Stem Auger	Easting Coordinate	:
Drilling Equipment:	: Foremost-Mobile B-57	Survey By	:

Sample Type:
SS Split Spoon (18 in. or 24 in.)
CB Core Barrel (5 ft.)
CT Auger Cuttings
NR No recovery

Depth in Feet	Surf. Elev. 4033	Sample Type	Recovery (ft.)	USCS	GRAPHIC	DESCRIPTION
0		CT		SP		0-4 ft. SAND, poorly graded (uniform), light brown, fine grained, dry
	4030			CA		4-6 ft. CALICHE, white (chalk color), dry
5		CT		SP		6-10 ft. SAND, poorly graded (uniform), light brown, fine grained, frequent small caliche gravels/fragments to 1/4", dry
	4025					9-10 ft. Increasing caliche gravels and silt
10		CT		ML		10-15 ft. SANDY SILT, very light brown, with occasional caliche gravel, very dry
	4020					
15		CT		SP		15-20 ft. SILTY SAND, light reddish brown, very fine grained, dry
	4015					
20		CB	1.9			20-23 ft. SAND, reddish-brown, very fine grained, dry
	4010			CL		23-25 ft. CLAY, brown, very stiff, dry, very plastic when wetted
25						25-27 ft. CLAY, brown, very stiff, dry
	4005	CB		CL/MS		27-30 ft. CLAY, green, some platey structure (claystone or mudstone), very fine crystals (calcite?), dry
30						30-33 ft. CLAY, brown and yellow, dry, crumbly
	4000	CB	1.8			33-34 ft. CLAY and claystone (mudstone), greenish gray, platey, crumbly, dry
35						34-35 ft. CLAY, grayish grading to brown at base, crumbly, dry



Well Construction Information

COMPLETION DATA

Hole Depth	: 35 ft. Below LS
TD Inside casing	: 27.5 ft. Below TOC

CASING, SCREEN & CAP

Material, joints	: PVC, threaded
Diameter	: 2 in. ID
Manufacturer	: LAIBE
Screen type	: Slotted
Screen length	: 10 ft.
Screen opening	: 0.020 slot
Scrn. placement	: 15-25 ft. BLS
Sump	: None
Bottom Cap	: 0.5 ft PVC
Protector Casing	: Steel box
Lock Key #	: - -

SEALS & SAND PACK

Cement seal type	: QuikCrete
Cem't placement	: 0 - ~2.5 ft. BLS
Grout placement	: - -
Annular seal type	: Aquagel bentonite
Seal volume	: 4 bg powder, hydrated
Seal placement	: 2.5-12.5 ft. BLS
Sand pack type	: 8/16 Oglebay silica
Sand volume	: 6 bags
Sand placement	: 12.5-25 ft. BLS
Lower Annular seal	: Native clay (backfill)
Seal placement	: 25-35 BLS

ELEVATIONS

Ground elevation	: Approx. 4035 ft.
Inner casing, top	: - -

WELL INSTALLATION:
Drilled to 35 feet with 8 1/4" auger to determine lithology. Backfilled to 25 ft. and installed well with 10 ft. screen. 6 bags 8/16 Oglebay-Norton sand to 12.5 ft., 4 bags Aquagel bentonite powder to 2.5 ft., hydrated. QuikCrete cement mix to surface. Installed locking steel protection casing, stick-up approximatel 2.5 ft.

WELL DEVELOPMENT:
None - well dry, 5/14/05

Notes:
Monitor well dry upon completion.
Location approximately 15 ft. north of service road between entrance and landfarm Cell 1.

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LOG OF WELL MW-2

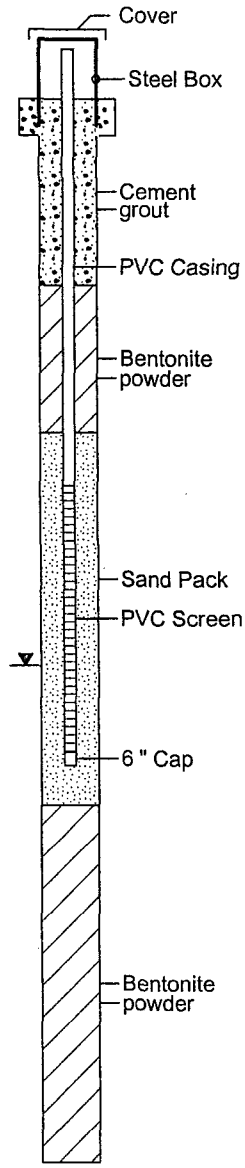
Groundwater Investigation
Artesia Aeration
Maljamar, New Mexico
N1/2, Section 7, T17S, R32E

Date, Time Started:	: 05/27/05; 1130	Drilled By:	: Eco/Enviro Drilling
Date, Time Completed	: 05/27/05; 1700	Logged By:	: D.G. Boyer, SESI
Hole Diameter:	: 8 1/4"	Northing Coordinate	:
Drilling Method:	: Hollow Stem Auger	Easting Coordinate	:
Drilling Equipment:	: Foremost-Mobile B-57	Survey By	:

Sample Type:
SS Split Spoon (18 in. or 24 in.)
CB Core Barrel (5 ft.)
CT Auger Cuttings
NR No recovery

Depth in Feet	Surf. Elev. 4012	Sample Type	Recovery (ft.)	USCS	GRAPHIC	DESCRIPTION
0						
	4010	CT		SP		0-5 ft. SAND, reddish brown, fine grained, uniform, dry
5	4005	CT				5-10 ft. SAND, brown to reddish brown, very fine to fine grained, slightly damp, caliche fragments to 1/2 in. at base
10	4000	CT				10-12 ft. SAND, brown to reddish brown, very fine to fine grained
				SP/GR		12-14 ft. GRAVELLY SAND, sand brown, fine grained, with granitic gravels to 1.5 in. Large gravels angular, smaller gravels rounded, quartz common in gravels
15				SP		
	3995	CT		SC		14-15 ft. SAND, as above
						15-20 ft. CLAYEY SAND, grading to sandy clay at 20 ft. Possible contact with redbeds.
20	3990	CB	2	CL		20-25 ft. GRAVELLY SILTY CLAY/ GRAVELLY SANDY CLAY, reddish brown, with very hard caliche in tip, gravels are caliche gravels.
25	3985	CB	5	CL		25-28.5 ft. CLAY, reddish brown, very dry (redbed) 28.5-29 ft. CLAY, green-gray-brown striations, very dry
30				CL/CS		29-31 ft. CLAY and CLAYSTONE, clay brown, claystone dark brown, partially consolidated, poorly cemented, very dry
	3980	CB	5	CL		
				MS		31-33.1 ft. CLAY, reddish brown, stiff, very dry, powdery when broken
35				CL/CS		
	3975	CB	5	CS		33.1-35 ft. CLAYSTONE, dark brown, poorly consolidated, poorly cemented, dry
40						35-35.9 ft. CLAY and CLAYSTONE, reddish-brown, very dry
						36.9-40 ft. CLAYSTONE, dark brown, poorly cemented, occasional green inclusions (pea size), occasional caliche streak, very dry

Well: MW-2
Elev.:



Well Construction Information

COMPLETION DATA

Hole Depth	: 40 ft. Below LS
TD Inside casing	: 28.29 ft. Below TOC

CASING, SCREEN & CAP

Material, joints	: PVC, threaded
Diameter	: 2 in. ID
Manufacturer	: LAIBE
Screen type	: Slotted
Screen length	: 10 ft.
Screen opening	: 0.020 slot
Scrn. placement	: 15-25 ft. BLS
Sump	: None
Bottom Cap	: 0.5 ft PVC
Protector Casing	: Above grade steel
Lock Key #	: - -

SEALS & SAND PACK

Cement seal type	: *QuikCrete*
Cem't placement	: 0 - 7 ft. BLS
Grout placement	: - -
Annular seal type	: Aquagel bentonite
Seal volume	: 3 bg powder, hydrated
Seal placement	: 7-12.5 ft. BLS
Sand pack type	: 8/16 Oglebay silica
Sand volume	: 9 bags
Sand placement	: 12.5-25 ft. BLS
Lower Annular seal	: 5 bg powder, hydrated
Seal placement	: 26.5-40 BLS

ELEVATIONS

Ground elevation	: Approx. 4035 ft.
Inner casing, top	: - -

WELL INSTALLATION:
Drilled to 40 feet with 8 1/4" auger to determine lithology. Backfilled to 25 ft. and installed well with 10 ft. screen. 5 bags *bentonite powder* to 26.5 ft., 1.5 bags 8/16 Oglebay-Norton sand to 25 ft., 7.5 bags to 12.5 ft, 3 bags Aquagel bentonite powder to 7 ft., hydrated. QuikCrete cement mix to surface. Installed locking steel protection casing, stick-up approximatel 3.2 ft. above land surface. Water at 24.86 BTC.

WELL DEVELOPMENT:
On 05/29/05 measured DTW at 24.49 ft. BTC. Pumped out approximately 2.5 gallons and collected water sample.

On 06/03/05 measured water at 24.56 ft. and pumped 1.5 gallon until dry.

Notes:
Location south side of service road opposite SE corner of landfarm Cell 6.

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LOG OF BORING BH-3

Groundwater Investigation
Artesia Aeration
Maljamar, New Mexico
N1/2, Section 7, T17S, R32E

Date, Time Started:	: 06/29/05; 1100	Drilled By:	: Eco/Enviro Drilling
Date, Time Completed	: 06/29/05; - -	Logged By:	: D.G. Boyer, SESI
Hole Diameter:	: 8 1/4"	Northing Coordinate	:
Drilling Method:	: Hollow Stem Auger	Easting Coordinate	:
Drilling Equipment:	: Foremost-Mobile B-57	Survey By	:

Sample Type:
SS Split Spoon (18 in. or 24 in.)
CB Core Barrel (5 ft.)
CT Auger Cuttings
NR No recovery

Depth in Feet	Sample Type	Recovery (ft.)	USCS	GRAPHIC	DESCRIPTION
0	CB	1.4	SP		0-5 ft. SAND, reddish brown, very fine grained, approx. 1 in. caliche and sand at 5 ft., chalk color
5					5-5.8 ft. SAND, reddish brown, very fine grained
			CA		5.8-7 ft. CALICHE, chalk-color with brown inclusions, soft
	CB	5	SP		7-10 ft. SAND with caliche fragments, chalk color, very fine grained, soft caliche, dry
10					10-10.5 ft. SAND, very light brown, with sandstone "cookies"
			SW		10.5-12 ft. GRAVELLY SAND, sand very light brown, very fine to fine grained, gravels are granitic to 3/4 in.
	CB	3.8	SP		12-13.5 ft. SAND, brown, very fine grained, granitic gravels at 13.5 ft.
			SS		13.5-13.7 ft. SANDSTONE, poorly cemented, dry
15			SS/SL		15-17.3 ft. SANDSTONE/SILTSTONE, poorly consolidated and poorly cemented.
	CB	2.7	SP		17.3-17.5 ft. SAND, light brown, very fine grained, dry
20	CB	NR	- -		20-25 ft. No recovery, nothing in core or on tip, dry core barrel
25			SS/SL		25-26 ft. SANDSTONE/SILTSTONE, light brown, very fine grained, hard.
	CB	3.7	CL		26-28.7 ft. Red-bed CLAY, reddish-brown, very stiff, very dry
30					

Notes:
Location 65 ft. south of MW-2 between MW-2 and water pipeline. Backfilled with 10 bags 3/8 in. Holeplug bentonite chips, hydrated.

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LOG OF BORING BH-4

Groundwater Investigation
Artesia Aeration
Maljamar, New Mexico
N1/2, Section 7, T17S, R32E

Date, Time Started:	: 06/29/05; - -	Drilled By:	: Eco/Enviro Drilling
Date, Time Completed	: 06/29/05; 1630	Logged By:	: D.G. Boyer, SESI
Hole Diameter:	: 8 1/4"	Northing Coordinate	:
Drilling Method:	: Hollow Stem Auger	Easting Coordinate	:
Drilling Equipment:	: Foremost-Mobile B-57	Survey By	:

Sample Type:
SS Split Spoon (18 in. or 24 in.)
CB Core Barrel (5 ft.)
CT Auger Cuttings
NR No recovery

Depth in Feet	Sample Type	Recovery (ft.)	USCS	GRAPHIC	DESCRIPTION
0	CB	2	AR		0-1.7 Fill material (rock, sand), damp
			SP		1.7-2 ft. SAND, brown, very fine to fine grained, damp
5	CB	5	SC		5-5.4 ft. CLAYEY SAND, reddish-brown, slightly damp
			CA/CL		5.4-6.6 ft. CALICHE (soft), chalk color and sandy clay, brown
			CA		6.6-8.0 ft. CALICHE, sandy (or caliche sand) soft, very light brown,
			SP		8.0-10.0 ft. SAND, limey sand grading to brown sand, very fine grained, dry core
10	CB	3.8			10-12.6 ft. SAND, brown, very fine grained
					12.6-13.8 ft. SAND, limey, chalk white, very fine grained, silty, powdery in spots, Hard chert/sandstone rock at base (15 ft.), dry core
15	CB	2.2			15-16.2 ft. SAND, very light brown, very fine grained, limey, dry
			SP/SS		16.2 ft. SANDSTONE rock at 16.2 ft., hard, well cemented 16.2-17.2 ft. SAND and SANDSTONE, sand limey, very fine grained, sandstone consolidated but poorly cemented, dry
20	CB	4.2	SS/SP		20-21.9 ft. SANDSTONE and SAND, sandstone poorly consolidated, medium cementing; sand brown, very fine grained, dry
			CL		21.9-24.2 ft. Redbed CLAY, brown, very stiff, very dry
25	CB	3.2	CL		25-28.2 ft. SANDY CLAY with some clayey sand, redbeds, hard, competent sandstone, rock in tip, dry.
30					

Notes:
Located in northern 2/3 center of Cell 5. Backfilled with 13 bags 3/8 in. Holeplug bentonite chips, hydrated.

Z:\SESCentral\Company Files\Artesia Aeration\Boring-well Logs\BH-4.BOR

P.O. Box 1613
703 E. Clinton Suite 102
Hobbs, New Mexico 88240
505/397-0510
FAX 505/393-4388
www.sesi-nm.com

Safety & Environmental Solutions, Inc.

September 28, 2007

Mr. Brad A. Jones
Environmental Engineer
New Mexico Oil Conservation Division
1220 South St. Francis Drive
Santa Fe, New Mexico 87505

Subject: Artesia Aeration Monitoring Well Installation/Work Plan, July 26, 2007
Request for Additional Information
Artesia Aeration Landfarm: Permit NM-01-0030
Location: Section 7, Township 17 South, Range 32 East, NMPM
Lea County, New Mexico

Dear Mr. Jones:

This letter is in response to your letter of August 6, 2007 providing comments on the work plan and requiring additional information before performing additional site characterization and investigative work including drilling and installing of additional boreholes or monitor wells.

Specifically you requested submittal of a revised boring plan that addresses the recommendations provided in the letter including the method of drilling, the plan to continuously core, proposed construction design details of the monitoring well, procedures to determine if groundwater is present and a surveyed site map showing the proposed boring location.

Attached with this letter is a revised work plan dated September 28, 2007 that addresses the concerns detailed in your letter and provides additional information.

Following your review and our addressing any further concerns you may have, and subsequent to OCD approval, we will set a drilling date and provide you with a 14-day notification of that date so that a representative of the agency can be present to witness the work.

If you have any questions, please contact me at (505) 397-0510.

Sincerely,

David G. Boyer, P.G.

Cc. Jim Wilson, Artesia Aeration
OCD District I Office, Hobbs

Work Plan
Artesia Aeration
Monitor Well Installation
Section 7, Township 17S, Range 32E
Lea County, New Mexico

Revised September 28, 2007

Prepared for:

Artesia Aeration
5614 Lovington Highway
Hobbs, NM 88240

By:

Safety & Environmental Solutions, Inc.
703 E. Clinton Suite 102
Hobbs, New Mexico 88240
(505) 397-0510

TABLE OF CONTENTS

I. Company/Agency Contacts

Name	Company	Telephone	e-mail
Jim Wilson	Artesia Aeration	505-746-9862 (o) 505-703-8383 (c)	marlaena@valornet.com
David Boyer, P.G.	SESI	505-397-0510 (o) 505-390-7067 (c)	dgboyer@sesi-nm.com

II. Purpose

The purpose of this work plan is to propose drilling and construction details of a ground water monitor well at the Artesia Aeration facility, which is located in Section 7, Township 17S, Range 32E, Eddy County, New Mexico. The facility location is located on private land approximately two miles west of the unincorporated community of Maljamar and is adjacent to and on the north side of US Highway 82. The location of the facility is shown in Figure 1.

III. Background

Artesia Aeration is an NM Oil Conservation Division (OCD) facility approved for the land farm remediation of hydrocarbon-contaminated soil resulting from current and past spills, leaks or other releases of petroleum hydrocarbon associated with the drilling and production of oil and natural gas. The facility desires to receive for long term encapsulation salt-contaminated soil resulting from produced water spills and leaks from said operations and is preparing an application for submittal to the OCD. The salt contaminated material will be placed in lined pits with a maximum depth, including liners, of 25 ft. beneath the land surface. The maximum area within the facility where such proposed pits may be located is shown on Figure 2, the topographic survey, as "Proposed Expansion Area".

As part of the application, Artesia Aeration will provide the OCD with information on groundwater, or lack thereof, in the vicinity of the proposed disposal pits. Safety and Environmental Solutions, Inc., has been engaged to supervise drilling and installation of a deep monitor well and will collect lithologic core samples and provide a report on the findings.

IV. Groundwater

Groundwater is generally absent in the area to the west of the Ogallala caprock at Maljamar. The lack of potable groundwater west of the caprock has been documented in several reports by the NM Bureau of Mines and the US Geological Survey (see Section VI, References).

There are three existing monitor wells on the property. Two are dry, including one drilled to a depth of 120 ft. located near the entrance to the property (see Figure 2, the topographic survey, showing the location of that well, MW-D1). The third well is located at the south end of, and between, cells 5 and 6. The well is adjacent to the Highway 82 bar ditch and shows a very thin saturated zone on top of red bed clays that is thought to be due to infiltration from intermittent ponded water in the ditch. Well construction information and water level measurement history is submitted in the Appendix and as Table 1, respectively. Updated information on all current and proposed wells will be submitted with the disposal application.

V. Action Plan

The following action plan for the location and construction of the proposed monitor well is presented below. A diagram of the proposed well is shown as Figure 3.

1. The proposed site of the well, identified as MW-3, is in the northeast corner of disposal cell 5 at a location shown on Figures 1 and 2. An elevated pad and access road have been constructed to the site and the well will be elevated above the surrounding surface. It will be marked and New Mexico One-Call will be contacted to provide buried line identification within a radius of 50 ft. of the proposed drill location.
2. The proposed monitor well (MW-3) will be drilled to a depth of 155 ft. below land surface (BLS). This depth was determined in the following manner. At the location of the proposed well, the surface elevation at the well pad is 4,028.37 ft. above mean sea level (Figure 2).
3. We have not prepared, nor is it necessary to prepare, detailed drawings of the pits at this stage of the investigation where we are determining the suitability of the site for its intended use. Knowing the extent of the pit area and maximum depth of the pits is sufficient to determine a drilling and monitor well target depth. For this submittal, it was determined as follows: The surface elevation of any proposed pit furthermost from and topographically downgradient from the proposed well is just over 4,000 ft. The maximum depth of the pits including liners and the leak detection system will be 25 ft. A depth 100 ft. below the maximum depth will be at an elevation of 4,000 ft. minus 25 ft. minus 100 ft., or 3,875 ft. Below Land surface (BLS). The difference in elevation between that at the proposed well location and 3,875 ft. is 153.4 ft. As coring is performed in 5 ft. intervals, the maximum depth of the boring/well is proposed to be 155 ft.
4. The drilling equipment to be used will be a hollow-stem auger with a five-foot splitspoon core barrel for collection and examination of lithologic samples. The core barrel will be advanced and samples will be taken continuously from the surface to total depth in five-foot intervals. Detailed geologic logs will be maintained for each well. The picture in Figure 3, from an unrelated location, shows a typical recovery core using this method. Changes in lithology, color, grain size, etc. are easily logged using this method of sample recovery. The monitor well and boring information provided in the appendix was collected using this method of sampling.
5. The drilling and coring shall continue until the initial water-bearing zone is encountered or to a maximum depth of 155 ft. if such zone is not encountered. If the samples at the base of the sand or other locations above the projected depth are moist and damp, drilling will cease to allow for sufficient time to determine if enough water is present to install a monitoring well. To prevent hole collapse, a temporary casing may be installed for that purpose. If water is present in the borehole in the sand above the top of the redbed clay, the temporary well will be re-completed as a shallow 2-inch diameter monitor well with ten feet of screen and a second well drilled to the projected depth.

6. The deep well (and the shallow one if necessary) will be completed as a 2-inch diameter monitor well with ten feet of screen, a sand filter pack two feet above the top of the screen, a two-foot bentonite seal (hydrated), and a bentonite-cement grout to the surface. Surface completion will be a steel, above ground protection casing with a locking cap and a cement pad. An example of a monitor well with these construction details is shown in Figure 4.
7. OCD will be notified at least 14-days in advance of the drilling so that an OCD representative can make the necessary arrangements to be present at the site during the drilling and installation of the monitor well.
8. Following completion of the well, a drilling log, well installation log and narrative report will be completed and submitted to Artesia Aeration, NM OCD and the NM State Engineer Office. Water level measurements and water quality sampling will be performed on a frequency and for constituents as required by the NM OCD.

VI. References

Ash, S.R., 1963. Ground-water conditions in northern Lea County, New Mexico: U.S. Geological Survey, Hydrologic Investigations Atlas, HA-62, 2 plates.

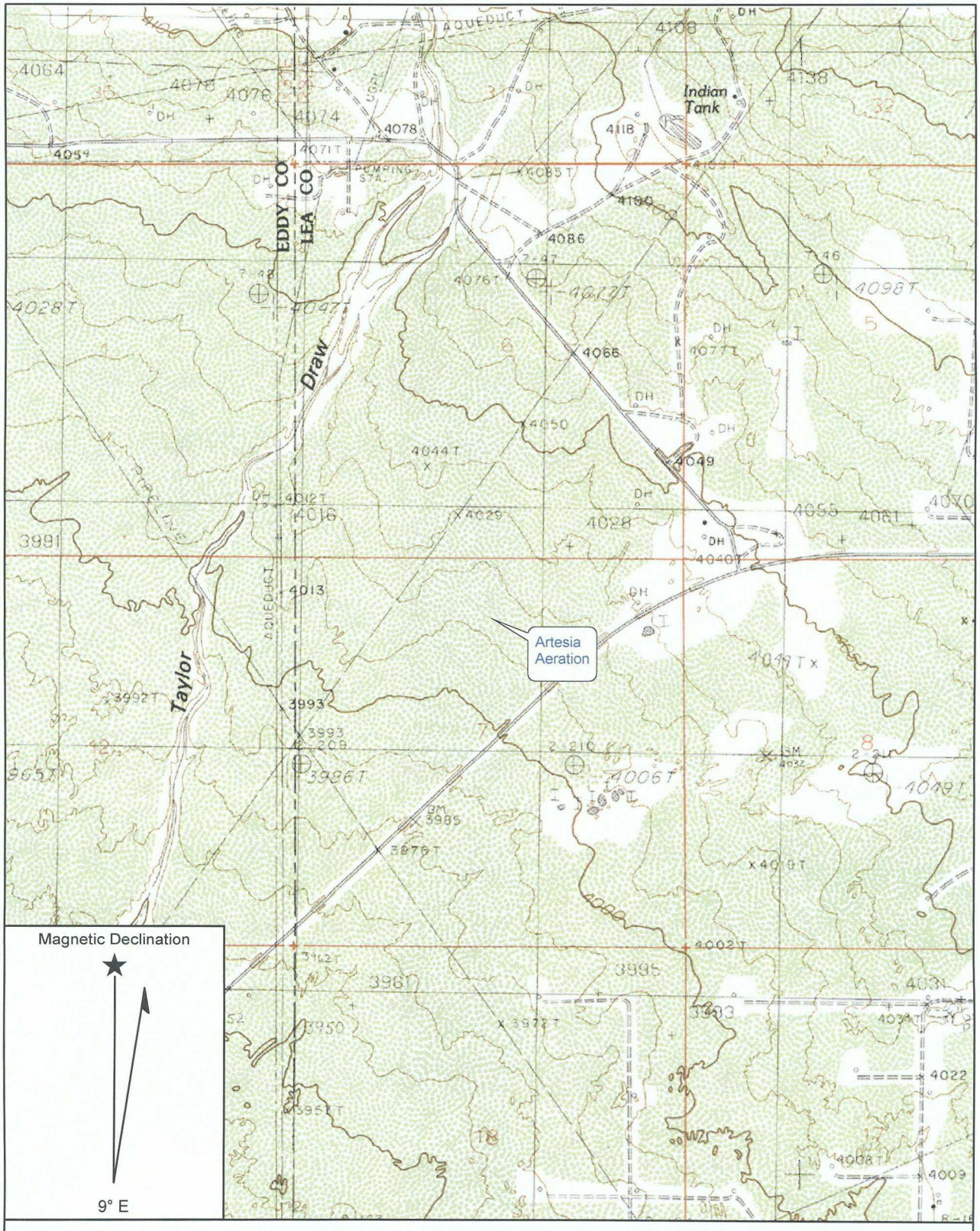
Nicholson, A. Jr., and Clebsch, A. Jr., 1961. Geology and ground-water conditions in southern Lea County, New Mexico: N. Mexico Institute of Mining and Technology, State Bureau of Mines and Mineral Resources Ground Water Report #6, 123 p.

VII. Work Plan Table and Figures

Table 1. Water Level Measurements, Artesia Aeration, Lea County, New Mexico

Monitor Well Name, Total Depth Below TOC (feet)	Elevation Top of Casing (feet)	Ground Level Elevation (feet), Note	Date Measured	Depth to Water Below TOC (feet)	Water Level Elev. (feet)	Water Saturated Thickness (feet)	Water Level Change (ft)
MW-1	4,036.21	4,032.91	05/21/05	Dry	- -	- -	- -
28.02			06/01/05	Dry	- -	- -	- -
			06/03/05	Dry	- -	- -	- -
			06/08/05	Dry	- -	- -	- -
			06/29/05	Dry	- -	- -	- -
			07/12/05	Dry	- -	- -	- -
			07/14/05	Dry	- -	- -	- -
			07/22/05	Dry	- -	- -	- -
			07/26/05	Dry	- -	- -	- -
			08/02/05	Dry	- -	- -	- -
			08/05/05	Dry	- -	- -	- -
			08/09/05	Dry	- -	- -	- -
			12/15/05	Dry	- -	- -	- -
			08/13/07	Dry	- -	- -	- -
MW-2	4,015.60	4,012.42	05/29/05	24.49	3,991.11	3.8	- -
28.32		*	06/01/05	24.59	3,991.01	3.7	-0.10
		*	06/03/05	24.56	3,991.04	3.8	0.03
		*	06/08/05	24.66	3,990.94	3.7	-0.10
		*, 10:30 am	06/29/05	24.97	3,990.63	3.4	-0.31
		*, 3:45 pm	06/29/05	25.24	3,990.36	3.1	-0.27
		*	07/12/05	25.22	3,990.38	3.1	0.02
		*	07/14/05	25.24	3,990.36	3.1	-0.02
		*	07/22/05	25.39	3,990.21	2.9	-0.15
		*	07/26/05	25.43	3,990.17	2.9	-0.04
		*	08/02/05	21.60	3,994.00	6.7	3.83
		*	08/05/05	21.07	3,994.53	7.3	0.53
		*	08/09/05	21.01	3,994.59	7.3	0.06
			12/15/05	23.33	3,992.27	5.0	-2.32
		*	08/13/07	24.35	3,991.25	4.0	-1.02
MW-3	- -	4028.37	Not drilled	- -	- -	- -	- -
- -							
MW-D1	4,037.08	4,032.40	05/13/99	Dry	- -	- -	- -
124.68			05/21/05	Dry	- -	- -	- -
			08/13/07	Dry - unable to determine total depth			- -
Locations surveyed 08/08/07							
* - Pumped dry after measurement							

Figure 1. Location Map, Artesia Aeration, Lea County, New Mexico

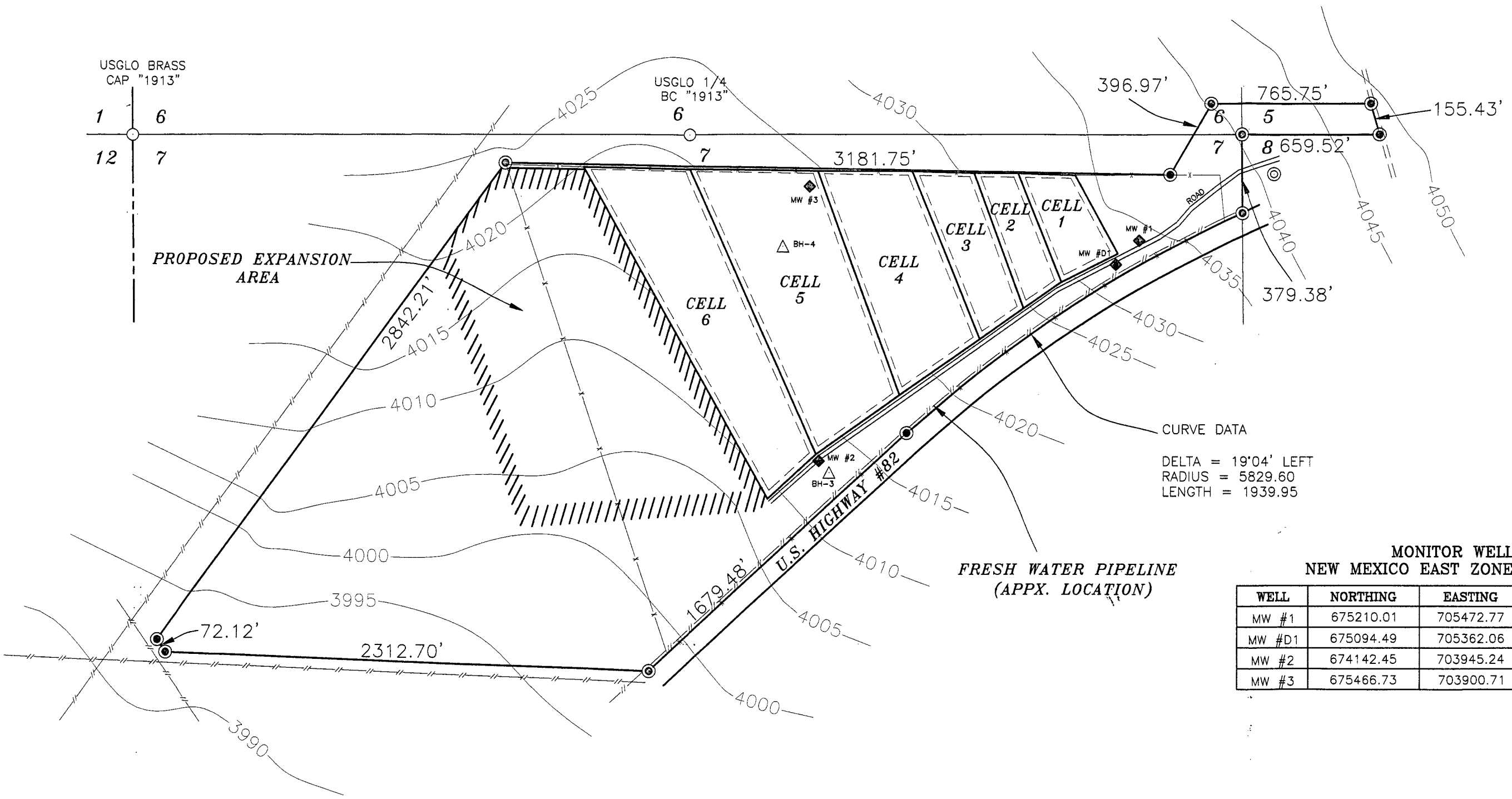


Name: MALJAMAR
Date: 9/28/2007
Scale: 1 inch equals 2000 feet

Location: 032° 51.2566' N 103° 48.3556' W NAD 83
Caption: Figure 1. Location Map, Artesia Aeration, Lea County, New Mexico

Figure 2. Topographic Survey, Artesia Aeration
Lea County, New Mexico

TOPOGRAPHIC SURVEY OF ARTESIA AERATION LLC LAND FARM IN SECTIONS 5, 6, & 7, TOWNSHIP 17 SOUTH, RANGE 32 EAST, N.M.P.M., LEA COUNTY, NEW MEXICO



MONITOR WELLS
NEW MEXICO EAST ZONE – NAD 83

WELL	NORTHING	EASTING	ELEVATION @ TOP OF CASING	GROUND ELEVATION
MW #1	675210.01	705472.77	4036.21'	4032.91'
MW #D1	675094.49	705362.06	4037.08'	4032.40'
MW #2	674142.45	703945.24	4015.60'	4012.42'
MW #3	675466.73	703900.71	–	4028.37'

TERRY J. ASEL
NEW MEXICO
15079
REGISTERED SURVEYOR

NOTES:
HORIZONTAL COORDINATES WERE ESTABLISHED BY USING GPS (GLOBAL POSITIONING SYSTEM). AND ARE NEW MEXICO EAST ZONE, NAD 83, U.S. SURVEY FEET VALUES.

ELEVATIONS WERE ESTABLISHED BY CONVENTIONAL LEVELING BASED OFF MONUMENT "WILSON" ELEVATION OF 4042.99' (NAVD 88)

YORS CERTIFICATE

J. ASEL, NEW MEXICO PROFESSIONAL SURVEYOR
9, DO HEREBY CERTIFY THAT I CONDUCTED AND AM
SIBLE FOR THIS SURVEY, THAT THIS SURVEY IS TRUE
RRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF,
ETS THE "MINIMUM STANDARDS FOR SURVEYING IN
XICO" AS ADOPTED BY THE NEW MEXICO STATE
OF REGISTRATION FOR PROFESSIONAL ENGINEERS
RVEYORS.

9/28/2007

Asel N.M. R.P.S. No. 15079

LEGEND

◆ – DENOTES MONITOR WELL

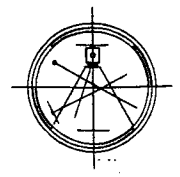
△ – DENOTES BORE HOLE

◉ – DENOTES PROPERTY CORNER

◎ – DENOTES SET 1/2" REBAR W/PVC CAP MARKED ASEL CONTROL PT. (WILSON) BENCHMARK FOR ELEVATIONS

Asel Surveying
& Consulting

P.O. BOX 393 – 310 W. TAYLOR
HOBBS, NEW MEXICO – 505-393-9146



500' 0 500' 1000' FEET

SCALE: 1"=500'

ARTESIA AERATION LLC

TOPOGRAPHIC SURVEY OF ARTESIA AERATION LLC LAND FARM IN SECTIONS 5, 6, & 7, TOWNSHIP 17 SOUTH, RANGE 32 EAST, N.M.P.M., LEA COUNTY, NEW MEXICO.

Survey Date: 08/08/2007	W.O. Number: 070808MW-REV.B
	File: 070808MW-REV.B.DWG
Date: 09/28/2007	Drafted By: KA

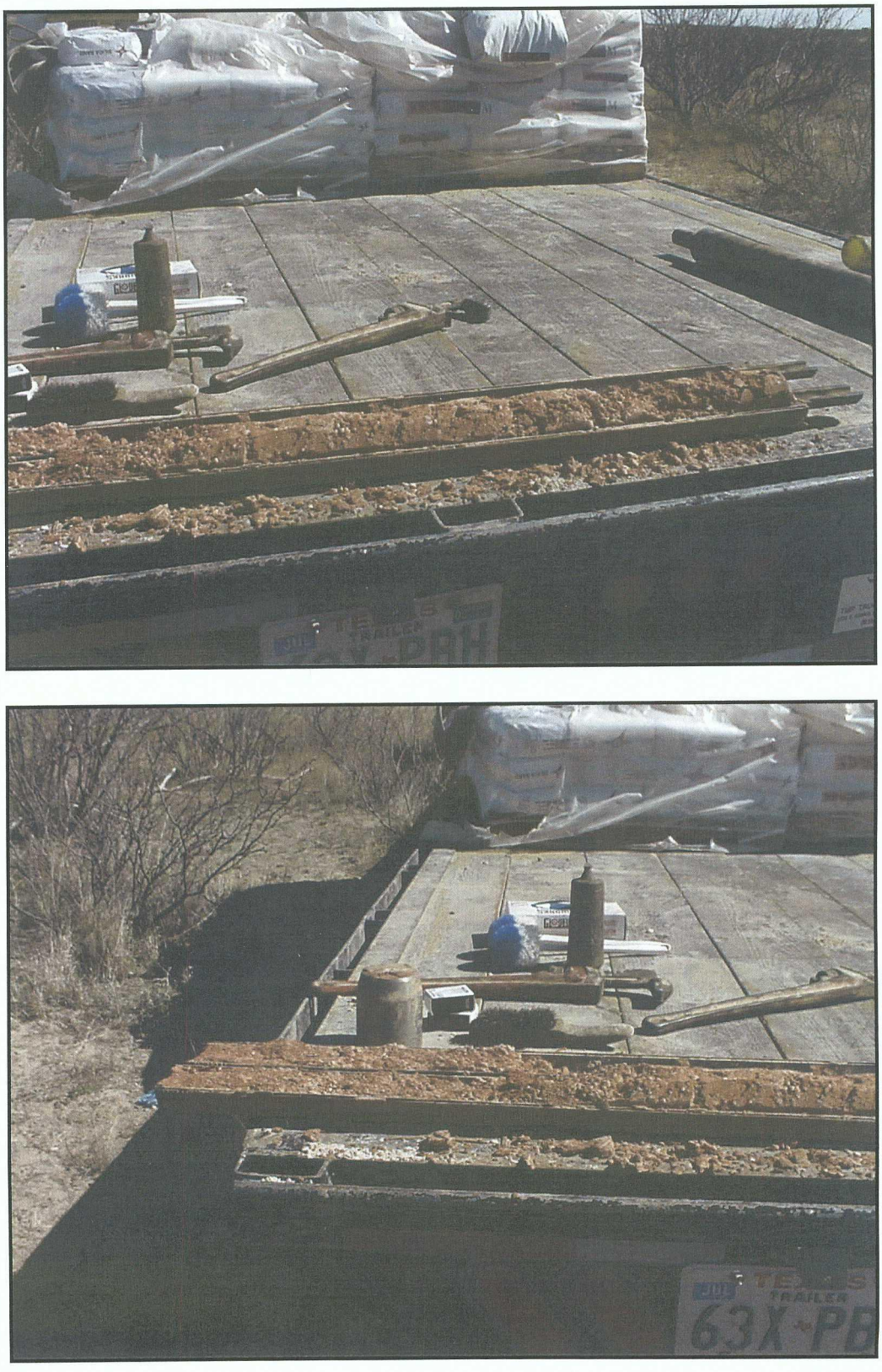


Figure 3. Example of five-foot core barrel sampling method (from an unrelated location)

Figure 4. Diagram of Proposed Monitor Well Construction

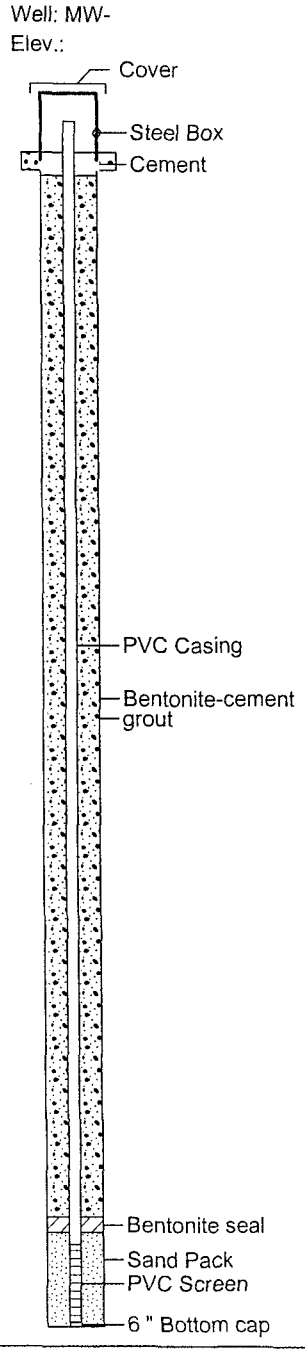
EXAMPLE LOG OF PROPOSED WELL

Groundwater Investigation
Artesia Aeration
Maljamar, New Mexico
N1/2, Section 7, T17S, R32E

Date, Time Started:	:	Drilled By:	: Eco/Enviro Drilling
Date, Time Completed	:	Logged By:	: D.G. Boyer
Hole Diameter:	: 8 1/4"	Northing Coordinate	:
Drilling Method:	: Hollow Stem Auger	Easting Coordinate	:
Drilling Equipment:	: Foremost-Mobile B-57	Survey By	:

Sample Type:
SS Split Spoon (18" or 24")
CB Core Barrel (2' or 5')
CT Auger Cuttings
NR No recovery

Depth in Feet	Sample Type	USCS	GRAPHIC	DESCRIPTION
0–25	CB	SP		0-25 ft. SAND
25–40	CB	CL		25-40 ft. CLAY, green
40–100	CB	CL/CA		40-100 ft. Red CLAY and CALICHE
100–110	CB	CA		100-110 ft. CALICHE
110–120	CB	CL		110-120 ft. CLAY, Red and Green
120–150	CB	??		120-150 ft. (Unknown)



Well Construction Information

COMPLETION DATA

Hole Depth	: 150 ft. Below LS
TD Inside casing	: 154 ft. Below TOC

CASING, SCREEN & CAP

Material, joints	: PVC, threaded
Diameter	: 2 in. ID
Manufacturer	: LAIBE
Screen type	: Slotted
Screen length	: 10 ft.
Screen opening	: 0.020 slot
Scrn. placement	: 140-150 ft. BLS
Sump	: None
Bottom Cap	: 0.5 ft PVC
Protector Casing	: Steel box
Lock Key #	: - -

SEALS & SAND PACK

Cement seal type	: Concrete
Cem't placement	: 0 - 3 ft. BLS
Grout placement	: - -
Annular seal type	: Bentonite chips
Seal volume	: __ bags, hydrated
Seal placement	: 3-138 ft. BLS
Sand pack type	: 8/16 Oglebay silica
Sand volume	: __ bags
Sand placement	: 138-150 ft. BLS
Lower Annular seal	: - -
Seal placement	: - -

ELEVATIONS

Ground elevation	: Approx. 4025 ft.
Inner casing, top	: - -

WELL INSTALLATION:
Drilled to 150 feet with 8 1/4" auger to determine lithology. Installed well with 10 ft. screen. __ bags 8/16 Oglebay-Norton sand to 138 ft., __ bags bentonite chips to 3 ft., hydrated. Cement mix to surface. Installed locking steel protection casing, stick-up approximatel 4 ft.

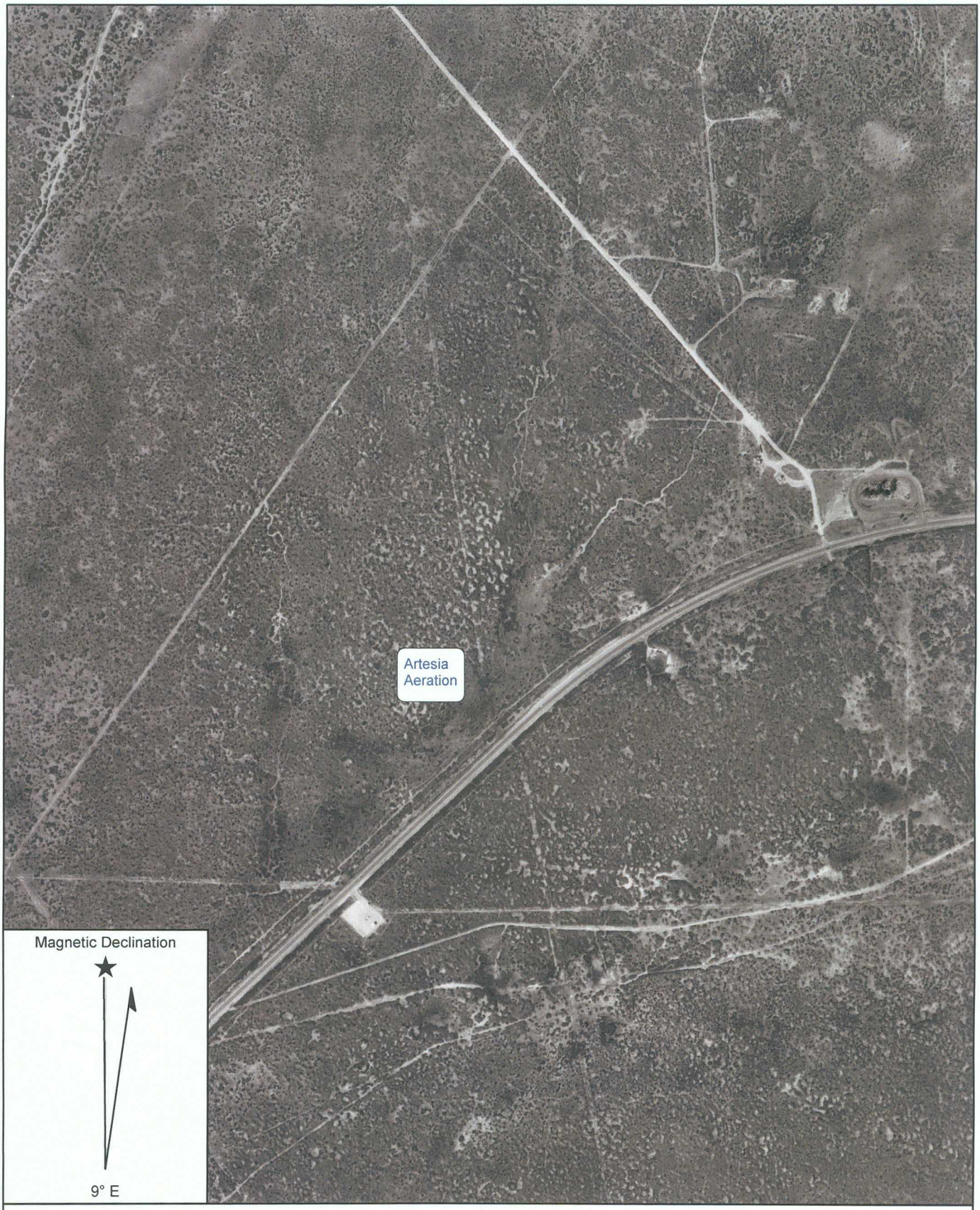
WELL DEVELOPMENT:

Notes:
Location northeast corner cell 5.
Sample lithology taken from existing deep well drilled to 120 ft. in 1999.

\\Sescentral\e\SESCentral\Company Files\Artesia Aeration\ARA-07-001 2007 Monitor Well and Plan\Proposed Deep Mon Well.BOR

VIII. Appendix - Supporting Information:

- **USGS Aerial Photograph (1996)**
- **Borehole/Monitor Well Logs**



Name: MALJAMAR NE, NM
Date: 9/28/2007
Scale: 1 inch equals 1000 feet

Location: 032° 51.2868' N 103° 48.1703' W NAD 83
Caption: Aerial Photograph, Artesia Aeration, Lea County, New Mexico (October, 1996)

Revised June 1972

STATE ENGINEER OFFICE

WELL RECORD

Section 1. GENERAL INFORMATION

(A) Owner of well Artesia Aeration LLC Owner's Well No. _____

Street or Post Office Address P.O. Box 248

City and State Artesia N.M. 88210

Well was drilled under Permit No. _____ and is located in the:

a. _____ ¼ _____ ¼ _____ ¼ _____ ¼ of Section _____ Township _____ Range _____ N.M.P.M.

b. Tract No. _____ of Map No. _____ of the _____

c. Lot No. _____ of Block No. _____ of the _____
Subdivision, recorded in Lea County.

d. X= _____ feet, Y= _____ feet, N.M. Coordinate System _____ Zone in the _____ Grant.

(B) Drilling Contractor C&R DRILLING License No. 763

Address 7217 ROSWELL HWY. ARTESIA N.M. 88210

Drilling Began 5-12-99 Completed 5-13-99 Type tools Rotary Size of hole 7½ in.

Elevation of land surface or _____ at well is _____ ft. Total depth of well 120 ft.

Completed well is ☒ shallow ☐ artesian. Depth to water upon completion of well 0 ft.

Section 2. PRINCIPAL WATER-BEARING STRATA

Depth in Feet From	Depth in Feet To	Thickness in Feet	Description of Water-Bearing Formation	Estimated Yield (gallons per minute)

Section 3. RECORD OF CASING

Diameter (inches)	Pounds per foot	Threads per in.	Depth in Feet Top	Depth in Feet Bottom	Length (feet)	Type of Shoe	Perforations From	Perforations To

Section 4. RECORD OF MUDDING AND CEMENTING

Depth in Feet From	Depth in Feet To	Hole Diameter	Sacks of Mud	Cubic Feet of Cement	Method of Placement
0	20	7½"	1qel		By hand

Section 6. LOG OF HOLE

Depth in Feet From	Depth in Feet To	Thickness in Feet	Color and Type of Material Encountered
0	25	25	Sand
25	40	15	Green clay
40	110	60	Red clay & caliche
110	110	10	Caliche
110	120	10	Red clay & green clay

Section 7. REMARKS AND ADDITIONAL INFORMATION

Monitaring Hole

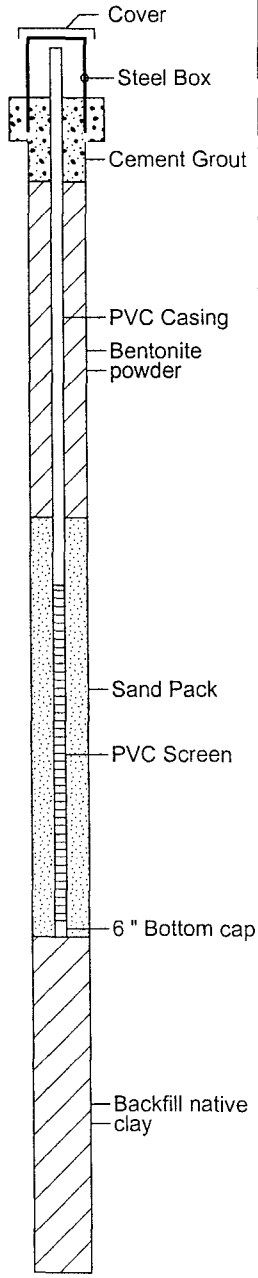
LOG OF WELL MW-1

Groundwater Investigation
Artesia Aeration
Maljamar, New Mexico
N1/2, Section 7, T17S, R32E

Date, Time Started:	: 05/14/05; 0900	Drilled By:	: Eco/Enviro Drilling
Date, Time Completed	: 05/14/05; 1430	Logged By:	: D.G. Boyer, SESI
Hole Diameter:	: 8 1/4"	Northing Coordinate	:
Drilling Method:	: Hollow Stem Auger	Easting Coordinate	:
Drilling Equipment:	: Foremost-Mobile B-57	Survey By	:

Sample Type:
SS Split Spoon (18 in. or 24 in.)
CB Core Barrel (5 ft.)
CT Auger Cuttings
NR No recovery

Depth in Feet	Sample Type	Recovery (ft.)	USCS	GRAPHIC	DESCRIPTION
0	CT		SP		0-4 ft. SAND, poorly graded (uniform), light brown, fine grained, dry
5			CA		4-6 ft. CALICHE, white (chalk color), dry
	CT		SP		6-10 ft. SAND, poorly graded (uniform), light brown, fine grained, frequent small caliche gravels/fragments to 1/4", dry -9-10 ft. Increasing caliche gravels and silt
10	CT		ML		10-15 ft. SANDY SILT, very light brown, with occasional caliche gravel, very dry
15	CT		SP		15-20 ft. SILTY SAND, light reddish brown, very fine grained, dry
20	CB	1.9			20-23 ft. SAND, reddish-brown, very fine grained, dry
			CL		23-25 ft. CLAY, brown, very stiff, dry, very plastic when wetted
25	CB				25-27 ft. CLAY, brown, very stiff, dry
			CL/MS		27-30 ft. CLAY, green, some platey structure (claystone or mudstone), very fine crystals (calcite?), dry
30	CB	1.8			30-33 ft. CLAY, brown and yellow, dry, crumbly 33-34 ft. CLAY and claystone (mudstone), greenish gray, platey, crumbly, dry 34-35 ft. CLAY, grayish grading to brown at base, crumbly, dry
35					



Well Construction Information

COMPLETION DATA

Hole Depth	: 35 ft. Below LS
TD Inside casing	: 27.5 ft. Below TOC

CASING, SCREEN & CAP

Material, joints	: PVC, threaded
Diameter	: 2 in. ID
Manufacturer	: LAIBE
Screen type	: Slotted
Screen length	: 10 ft.
Screen opening	: 0.020 slot
Scrn. placement	: 15-25 ft. BLS
Sump	: None
Bottom Cap	: 0.5 ft PVC
Protector Casing	: Steel box
Lock Key #	: - -

SEALS & SAND PACK

Cement seal type	: QuikCrete
Cem't placement	: 0 - ~2.5 ft. BLS
Grout placement	: - -
Annular seal type	: Aquagel bentonite
Seal volume	: 4 bg powder, hydrated
Seal placement	: 2.5-12.5 ft. BLS
Sand pack type	: 8/16 Oglebay silica
Sand volume	: 6 bags
Sand placement	: 12.5-25 ft. BLS
Lower Annular seal	: Native clay (backfill)
Seal placement	: 25-35 BLS

ELEVATIONS

Ground elevation	: Approx. 4035 ft.
Inner casing, top	: - -

WELL INSTALLATION:
Drilled to 35 feet with 8 1/4" auger to determine lithology. Backfilled to 25 ft. and installed well with 10 ft. screen. 6 bags 8/16 Oglebay-Norton sand to 12.5 ft., 4 bags Aquagel bentonite powder to 2.5 ft., hydrated. QuikCrete cement mix to surface. Installed locking steel protection casing, stick-up approximatel 2.5 ft.

WELL DEVELOPMENT:
None - well dry, 5/14/05

Notes:
Monitor well dry upon completion.
Location approximately 15 ft. north of service road between entrance and landfarm Cell 1.

Z:\SES\Central\Company Files\Artesia Aeration\Boring-well Logs\MW-1 Well.BOR

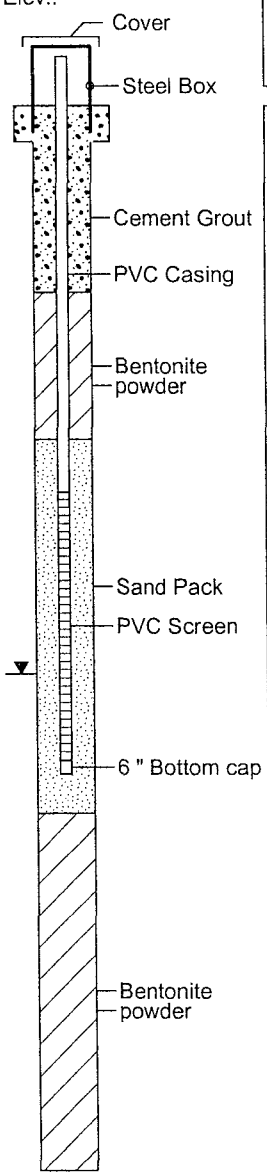
LOG OF WELL MW-2

Groundwater Investigation
Artesia Aeration
Maljamar, New Mexico
N1/2, Section 7, T17S, R32E

Date, Time Started:	: 05/27/05; 1130	Drilled By:	: Eco/Enviro Drilling
Date, Time Completed	: 05/27/05; 1700	Logged By:	: D.G. Boyer, SESI
Hole Diameter:	: 8 1/4"	Northing Coordinate	:
Drilling Method:	: Hollow Stem Auger	Easting Coordinate	:
Drilling Equipment:	: Foremost-Mobile B-57	Survey By	:

Sample Type:
SS Split Spoon (18 in. or 24 in.)
CB Core Barrel (5 ft.)
CT Auger Cuttings
NR No recovery

Depth in Feet	Sample Type	Recovery (ft.)	USCS	GRAPHIC	DESCRIPTION
0	CT		SP		0-5 ft. SAND, reddish brown, fine grained, uniform, dry
5	CT				5-10 ft. SAND, brown to reddish brown, very fine to fine grained, slightly damp, caliche fragments to 1/2 in. at base
10	CT				10-12 ft. SAND, brown to reddish brown, very fine to fine grained
	CT		SP/GP		12-14 ft. GRAVELLY SAND, sand brown, fine grained, with granitic gravels to 1.5 in. Large gravels angular, smaller gravels rounded, quartz common in gravels
15			SP		
	CT		SC		14-15 ft. SAND, as above
					15-20 ft. CLAYEY SAND, grading to sandy clay at 20 ft. Possible contact with redbeds.
20	CB	2	CL		20-25 ft. GRAVELLY SILTY CLAY/ GRAVELLY SANDY CLAY, reddish brown, with very hard caliche in tip, gravels are caliche gravels.
25	CB	5	CL		25-28.5 ft. CLAY, reddish brown, very dry (redbed) 28.5-29 ft. CLAY, green-gray-brown striations, very dry
30			CL/CS		29-31 ft. CLAY and CLAYSTONE, clay brown, claystone dark brown, partially consolidated, poorly cemented, very dry
	CB	5	CL		
			MS		31-33.1 ft. CLAY, reddish brown, stiff, very dry, powdery when broken
35			CL/CS		33.1-35 ft. CLAYSTONE, dark brown, poorly consolidated, poorly cemented, dry
	CB	5	CS		35-35.9 ft. CLAY and CLAYSTONE, reddish-brown, very dry
40					36.9-40 ft. CLAYSTONE, dark brown, poorly cemented, occasional green inclusions (pea size), occasional caliche streak, very dry.



Well Construction Information

COMPLETION DATA

Hole Depth	: 40 ft. Below LS
TD Inside casing	: 28.29 ft. Below TOC

CASING, SCREEN & CAP

Material, joints	: PVC, threaded
Diameter	: 2 in. ID
Manufacturer	: LAIBE
Screen type	: Slotted
Screen length	: 10 ft.
Screen opening	: 0.020 slot
Scrn. placement	: 15-25 ft. BLS
Sump	: None
Bottom Cap	: 0.5 ft PVC
Protector Casing	: Above grade steel
Lock Key #	: - -

SEALS & SAND PACK

Cement seal type	: QuikCrete
Cem't placement	: 0 - 7 ft. BLS
Grout placement	: - -
Annular seal type	: Aquagel bentonite
Seal volume	: 3 bg powder, hydrated
Seal placement	: 7-12.5 ft. BLS
Sand pack type	: 8/16 Oglebay silica
Sand volume	: 9 bags
Sand placement	: 12.5-25 ft. BLS
Lower Annular seal	: 5 bg powder, hydrated
Seal placement	: 26.5-40 BLS

ELEVATIONS

Ground elevation	: Approx. 4035 ft.
Inner casing, top	: - -

WELL INSTALLATION:
Drilled to 40 feet with 8 1/4" auger to determine lithology. Backfilled to 25 ft. and installed well with 10 ft. screen. 5 bags bentonite powder to 26.5 ft., 1.5 bags 8/16 Oglebay-Norton sand to 25 ft., 7.5 bags to 12.5 ft, 3 bags Aquagel bentonite powder to 7 ft., hydrated. QuikCrete cement mix to surface. Installed locking steel protection casing, stick-up approximatel 3.2 ft. above land surface. Water at 24.86 BTC.

WELL DEVELOPMENT:
On 05/29/05 measured DTW at 24.49 ft. BTC. Pumped out approximately 2.5 gallons and collected water sample.

On 06/03/05 measured water at 24.56 ft. and pumped 1.5 gallon until dry.

Notes:
Location south side of service road opposite SE corner of landfarm Cell 6.

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LOG OF BORING BH-3

Groundwater Investigation
Artesia Aeration
Maljamar, New Mexico
N1/2, Section 7, T17S, R32E

Date, Time Started:	06/29/05; 1100	Drilled By:	Eco/Enviro Drilling
Date, Time Completed	06/29/05; - -	Logged By:	D.G. Boyer, SESI
Hole Diameter:	8 1/4"	Northing Coordinate	
Drilling Method:	Hollow Stem Auger	Easting Coordinate	
Drilling Equipment:	Foremost-Mobile B-57	Survey By	

Sample Type:
SS Split Spoon (18 in. or 24 in.)
CB Core Barrel (5 ft.)
CT Auger Cuttings
NR No recovery

Depth in Feet	Sample Type	Recovery (ft.)	USCS	GRAPHIC	DESCRIPTION
0	CB	1.4	SP		0-5 ft. SAND, reddish brown, very fine grained, approx. 1 in. caliche and sand at 5 ft., chalk color
5	CB	5	SP		5-5.8 ft. SAND, reddish brown, very fine grained
			CA		5.8-7 ft. CALICHE, chalk-color with brown inclusions, soft
			SP		7-10 ft. SAND with caliche fragments, chalk color, very fine grained, soft caliche, dry
10	CB	3.8	SP		10-10.5 ft. SAND, very light brown, with sandstone "cookies"
			SW		10.5-12 ft. GRAVELLY SAND, sand very light brown, very fine to fine grained, gravels are granitic to 3/4 in.
			SP		12-13.5 ft. SAND, brown, very fine grained, granitic gravels at 13.5 ft.
			SS		13.5-13.7 ft. SANDSTONE, poorly cemented, dry
15	CB	2.7	SS/SL		15-17.3 ft. SANDSTONE/SILTSTONE, poorly consolidated and poorly cemented.
			SP		17.3-17.5 ft. SAND, light brown, very fine grained, dry
20	CB	NR	- -		20-25 ft. No recovery, nothing in core or on tip, dry core barrel
25	CB	3.7	SS/SL		25-26 ft. SANDSTONE/SILTSTONE, light brown, very fine grained, hard.
			CL		26-28.7 ft. Red-bed CLAY, reddish-brown, very stiff, very dry
30					

Notes:
Location 65 ft. south of MW-2 between MW-2 and water pipeline. Backfilled with 10 bags 3/8 in. Holeplug bentonite chips, hydrated.

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LOG OF BORING BH-4

Groundwater Investigation
Artesia Aeration
Maljamar, New Mexico
N1/2, Section 7, T17S, R32E

Date, Time Started:	: 06/29/05; - -	Drilled By:	: Eco/Enviro Drilling
Date, Time Completed	: 06/29/05; 1630	Logged By:	: D.G. Boyer, SESI
Hole Diameter:	: 8 1/4"	Northing Coordinate	:
Drilling Method:	: Hollow Stem Auger	Easting Coordinate	:
Drilling Equipment:	: Foremost-Mobile B-57	Survey By	:

Sample Type:
SS Split Spoon (18 in. or 24 in.)
CB Core Barrel (5 ft.)
CT Auger Cuttings
NR No recovery

Depth in Feet	Sample Type	Recovery (ft.)	USCS	GRAPHIC	DESCRIPTION
0	CB	2	AR		0-1.7 Fill material (rock, sand), damp
			SP		1.7-2 ft. SAND, brown, very fine to fine grained, damp
5	CB	5	SC		5-5.4 ft. CLAYEY SAND, reddish-brown, slightly damp
			CA/CL		5.4-6.6 ft. CALICHE (soft), chalk color and sandy clay, brown
			CA		6.6-8.0 ft. CALICHE, sandy (or caliche sand) soft, very light brown,
			SP		8.0-10.0 ft. SAND, limey sand grading to brown sand, very fine grained, dry core
10	CB	3.8			10-12.6 ft. SAND, brown, very fine grained
					12.6-13.8 ft. SAND, limey, chalk white, very fine grained, silty, powdery in spots, Hard chert/sandstone rock at base (15 ft.), dry core
15	CB	2.2			15-16.2 ft. SAND, very light brown, very fine grained, limey, dry
			SP/SS		16.2 ft. SANDSTONE rock at 16.2 ft., hard, well cemented 16.2-17.2 ft. SAND and SANDSTONE, sand limey, very fine grained, sandstone consolidated but poorly cemented, dry
20	CB	4.2	SS/SP		20-21.9 ft. SANDSTONE and SAND, sandstone poorly consolidated, medium cementing; sand brown, very fine grained, dry
			CL		21.9-24.2 ft. Redbed CLAY, brown, very stiff, very dry
25	CB	3.2	CL		25-28.2 ft. SANDY CLAY with some clayey sand, redbeds, hard, competent sandstone, rock in tip, dry.
30					

Notes:
Located in northern 2/3 center of Cell 5. Backfilled with 13 bags 3/8 in. Holeplug bentonite chips, hydrated.

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NEW MEXICO ENERGY, MINERALS and NATURAL RESOURCES DEPARTMENT

BILL RICHARDSON
Governor
Joanna Prukop
Cabinet Secretary

Mark E. Fesmire, P.E.
Director
Oil Conservation Division

August 6, 2007

Mr. Jim Wilson
Artesia Aeration, LLC
PO Box 310
Hobbs, New Mexico 88240

RE: Artesia Aeration Monitoring Well Installation/Work Plan
Request For Additional Information
Artesia Aeration Landfarm: Permit NM-01-0030
Location: Section7, Township 17 South, Range 32 East, NMPM
Eddy County, New Mexico

Dear Mr. Wilson:

The New Mexico Oil Conservation Division (OCD) has reviewed the work plan, submitted by Safety & Environmental Solutions, Inc. dated July 26, 2007 on the behalf of Artesia Aeration, to construct an additional boring or monitoring well in order to characterize the geology and hydrogeology at the proposed site. Based upon the review the work plan, the OCD has determined that the proposal does not appropriately address all the issues required to properly characterize the geology and hydrogeology of the proposed site. Additional information and modifications to the submittal are required. The following request for additional information is based on the format of the July 26, 2007 submittal.

Section III, Background

Please omit the word "disposal" from the first sentence. Artesia Aeration is approved for landfarming only. Landfarm is defined, in Paragraph (3) of Subsection A of Section 7 of 19.15.36 NMAC, as "a discrete area of land designated and used for the *remediation* of petroleum hydrocarbon-contaminated soils and drill cuttings." Disposal only applies to landfills.

Section IV, Groundwater

Please provide the drilling and installation logs for all of the existing monitoring wells that have been constructed at or within the vicinity of the site. Please provide a facility site map that indicates the location of each monitoring well. Also, please provide the current ground water elevation of each monitoring well, if applicable.

Section V, Action Plan

2. The proposed depth of the boring must be justified in order to demonstrate the siting criterion of Paragraph (1) of Subsection A of Section 13 of 19.15.36 NMAC. A proper demonstration should include a site map that illustrates site specific elevations of the proposed site, the location of the proposed landfill cells, the design (elevations) of the landfill cells, and the proposed location of the boring/monitoring well. The proposed landfill cell designs should illustrate the proposed depth and the required minimum 2 % slope across the bottom of the cell in order to facilitate the drainage and

collection of leachate. The current proposal to drill to a depth of 150 feet is not supported by the information requested above. Please provide the requested information above in order for the OCD to determine if an appropriate drill depth is appropriate.

3. The proposed drilling method does not provide the details of the retrieval of the core samples. Please provide the details of the coring method, such as advance or continuous coring and the depth intervals that it will be utilized. During drilling, detailed geologic logs shall be maintained throughout the length of each well. Sufficient data must be obtained to demonstrate and characterize the geology and hydrogeology of the site.

4. The drilling and coring shall continue until the initial water-bearing zone is encountered. Sufficient time should be allowed to pass in order to determine if enough water is present to install a monitoring well. Please omit the sentence regarding "measurable water." The regulations only address the separation to ground water; not "measurable water." Please modify this section to satisfy the requirements specified above.

5. OCD requires a two-foot bentonite seal be placed above the sand pack and the annular space above the seal filled with bentonite-cement grout to the surface. Please modify this section to satisfy the requirements specified above.

Section VII, Work Plan Figures, Example Log Of Proposed Well

Please modify the monitoring well construction log to reflect the construction detail requirements specified in the comments regarding Section V, Action Plan of this letter.

It is required that a representative from the OCD be present when the drilling occurs. The OCD requires that sufficient notification (at least 14 days) be provided, in order for the OCD representative to make the appropriate arrangements to be present. The purpose of the additional drilling is to assist in the characterization of the site. However, if the hydrogeologic conditions cannot be determined, additional borings or monitoring wells may be needed.

The OCD anticipates the submittal of a complete revised boring plan that addresses the recommendations provided above. The plan should include the method of drilling, the plan to continuously core, the proposed construction design details of the monitoring well, if installed, procedures to determine if ground water is present, and a site map indicating the proposed boring location. The plan must be approved by the OCD prior to the implementation of any site characterization and investigative work.

If you have any questions regarding this matter, please contact of me at (505) 476-3487 or brad.a.jones@state.nm.us.

Sincerely,

Brad A. Jones
Environmental Engineer

BAJ/baj

cc: OCD District II Office, Artesia
Mr. David Boyer, Safety & Environmental Solutions, Inc., Hobbs, NM

Work Plan
Artesia Aeration
Monitor Well Installation
Section 7, Township 17S, Range 32E
Lea County, New Mexico

July 26, 2007

Prepared for:

Artesia Aeration
5614 Lovington Highway
Hobbs, NM 88240

By:

Safety & Environmental Solutions, Inc.
703 E. Clinton Suite 102
Hobbs, New Mexico 88240
(505) 397-0510

TABLE OF CONTENTS

I. Company/Agency Contacts

Name	Company	Telephone	e-mail
Jim Wilson	Artesia Aeration	505-746-9862 (o) 505-703-8383 (c)	marlaena@valornet.com
David Boyer, P.G.	SESI	505-397-0510 (o) 505-390-7067 (c)	dgboyer@sesi-nm.com

II. Purpose

The purpose of this work plan is to propose drilling and construction details of a ground water monitor well at the Artesia Aeration facility, which is located in Section 7, Township 17S, Range 32E, Eddy County, New Mexico. The facility location is located on private land approximately two miles west of the unincorporated community of Maljamar and is adjacent to and on the north side of US Highway 82. The location of the well is shown in Figure 1.

III. Background

Artesia Aeration is an NM Oil Conservation Division (OCD) facility approved for the land farm disposal of hydrocarbon-contaminated soil resulting from current and past spills, leaks or other releases of petroleum hydrocarbon associated with the drilling and production of oil and natural gas. The facility desires to receive for disposal salt-contaminated soil resulting from produced water spills and leaks from said operations and is preparing an application for submittal to the OCD. The salt contaminated material will be disposed of in lined pits with a maximum depth of 25 ft. beneath the land surface. The proposed locations of the pit are shown in Figure 2 and the figure in the Appendix.

As part of the application, Artesia Aeration will provide the OCD with information on groundwater, or lack thereof, in the vicinity of the proposed disposal pits. Safety and Environmental Solutions, Inc., has been engaged to supervise drilling and installation of a deep monitor well and will collect lithologic core samples and provide a report on the findings.

IV. Groundwater

Groundwater is generally absent in the area to the west of the Ogallala caprock at Maljamar. The lack of potable groundwater west of the caprock has been documented in several reports by the NM Bureau of Mines and the US Geological Survey (see Section VI, References).

There are three existing monitor wells on the property. Two are dry, including one drilled to a depth of 120 ft. located near the entrance to the property (see Appendix figure showing the location of that well). The third well is located at the south end of, and between, cells 5 and 6. The well is adjacent to the Highway 82 bar ditch and shows a very thin saturated zone on top of red bed clays that is thought to be due to infiltration from intermittent ponded water in the ditch. A location map, construction and current water level Information on all wells will be submitted with the disposal application.

V. Action Plan

The following action plan for the location and construction of the proposed monitor well is presented below. A diagram of the proposed well is shown as Figure 3.

1. The proposed site of the well is in the northeast corner of disposal cell 5 at a location shown on Figures 1 and 2. An elevated pad and access road have been constructed to the site and the well will be elevated above the surrounding surface. It will be marked and New Mexico One-Call will be contacted to provide buried line identification within a radius of 50 ft. of the proposed drill location.
2. The proposed monitor well will be drilled to a depth of 150 ft. below land surface (BLS). This depth was determined in the following manner. At the location of the proposed well, the surface elevation is approximately 4,025 ft. above mean sea level (Figure 1). The surface elevation of the pit furthermost from and downgradient from the proposed well is just over 4,000 ft. The maximum depth of the pits will be 25 ft. A depth 100 ft. below the maximum depth will be at an elevation of 3,875 ft. BLS. The difference in elevation between that at the proposed well location and 3,875 ft. is 150 ft.
3. The drilling equipment to be used will be a hollow-stem auger with a five-foot splitspoon core barrel for collection and examination of lithologic samples. Samples will be taken continuously from the surface to total depth.
4. If the samples at the base of the sand or other locations above the projected depth are moist and damp, drilling will cease for 24 hours to allow for possible migration of moisture into the borehole. If measurable water in excess of one ft. above the top of the redbed clay is found, the well will be completed as a shallow 2-inch diameter monitor well with ten feet of screen and a second well drilled to the projected depth.
5. The deep well will be completed as a 2-inch diameter monitior well with ten feet of screen, a sand filter pack two feet above the top of the screen and a bentonite seal (hydrated) to within three feet of the surface. Surface completion will be a steel, above ground protection casing with a locking cap cemented from three feet to the surface.
6. Following completion of the well, a drilling log, well installation log and narrative report will be completed and submitted to Artesia Aeration, NM OCD and the NM State Engineer Office. Water level measurements and water quality sampling will be performed on a frequency and for constituents as required by the NM OCD.

VI. References

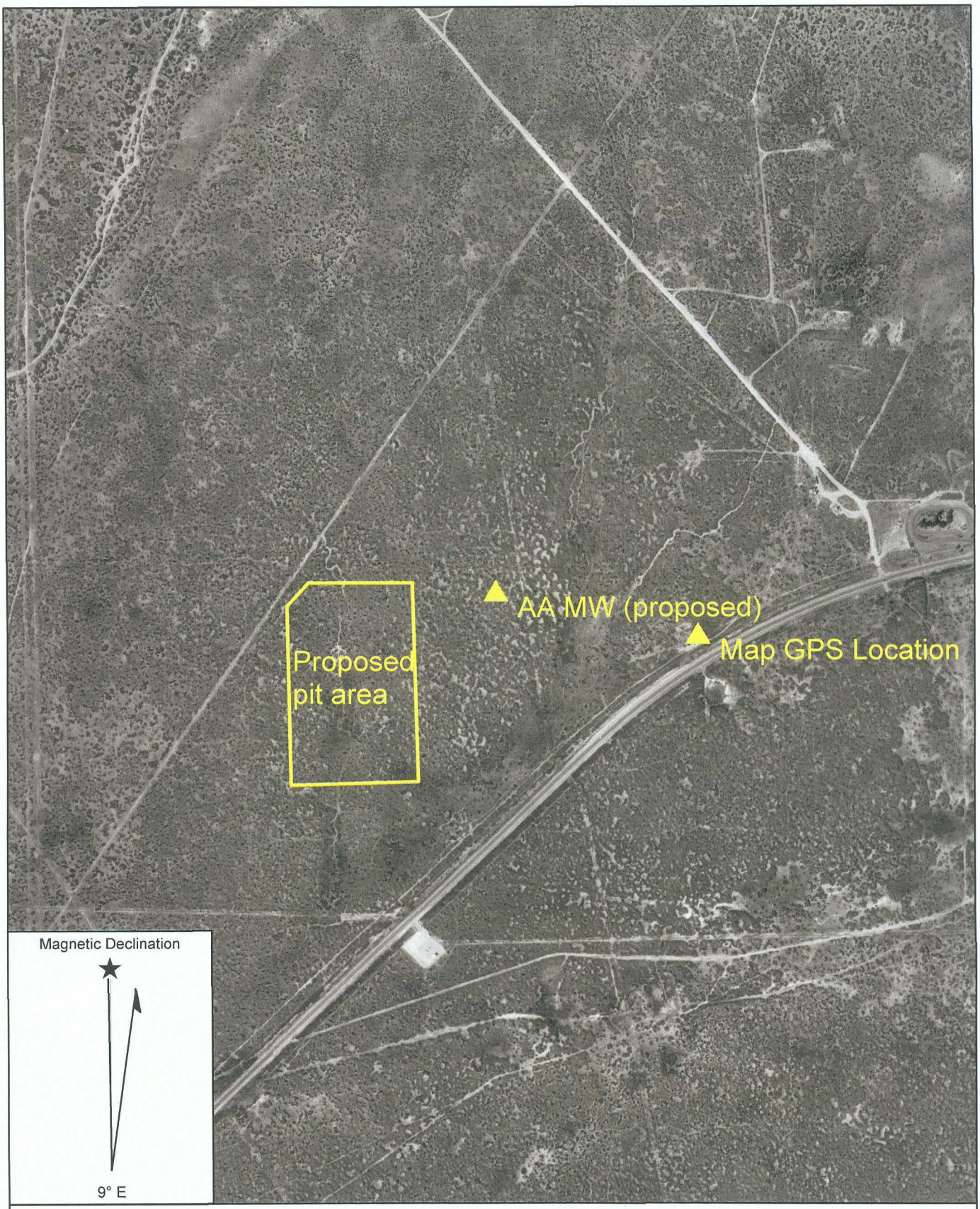
Ash, S.R., 1963. Ground-water conditions in northern Lea County, New Mexico: U.S. Geological Survey, Hydrologic Investigations Atlas, HA-62, 2 plates.

Nicholson, A. Jr., and Clebsch, A. Jr., 1961. Geology and ground-water conditions in southern Lea County, New Mexico: N. Mexico Institute of Mining and Technology, State Bureau of Mines and Mineral Resources Ground Water Report #6, 123 p.

VII. Work Plan Figures

Name: MALJAMAR
Date: 7/26/2007
Scale: 1 inch equals 2000 feet

Location: 032° 51.3386' N 103° 48.2568' W NAD 83
Caption: Figure 1. Location Map of Proposed Monitor Well and Pits



Name: MALJAMAR NE, NM
Date: 7/25/2007
Scale: 1 inch equals 1000 feet

Location: 032° 51.3263' N 103° 48.2516' W NAD 83
Caption: Figure 2. Aerial Photograph of Proposed Monitor Well Location and Pits

Safety & Environmental Solutions, Inc.

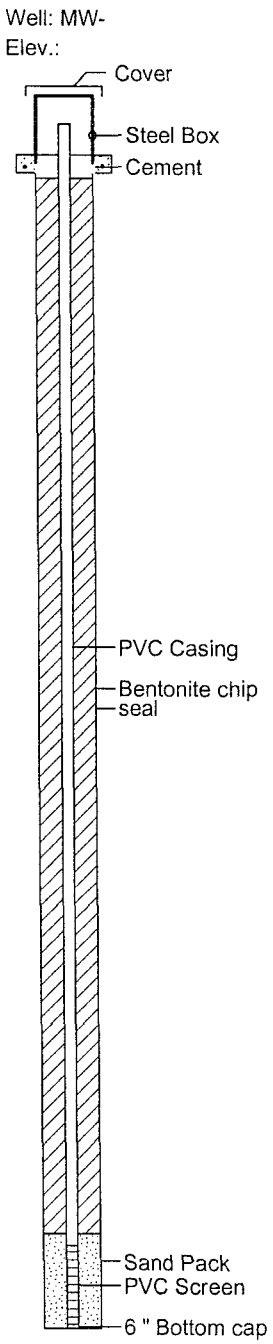
EXAMPLE LOG OF PROPOSED WELL

Groundwater Investigation
Artesia Aeration
Maljamar, New Mexico
N1/2, Section 7, T17S, R32E

Date, Time Started:	:	Drilled By:	: Eco/Enviro Drilling
Date, Time Completed	:	Logged By:	: D.G. Boyer
Hole Diameter:	: 8 1/4"	Northing Coordinate	:
Drilling Method:	: Hollow Stem Auger	Easting Coordinate	:
Drilling Equipment:	: Foremost-Mobile B-57	Survey By	:

Sample Type:
SS Split Spoon (18" or 24")
CB Core Barrel (2' or 5')
CT Auger Cuttings
NR No recovery

Depth in Feet	Sample Type	USCS	GRAPHIC	DESCRIPTION
0–25	CB	SP		0-25 ft. SAND
25–40	CB	CL		25-40 ft. CLAY, green
40–100	CB	CL/CA		40-100 ft. Red CLAY and CALICHE
100–110	CB	CA		100-110 ft. CALICHE
110–120	CB	CL		110-120 ft. CLAY, Red and Green
120–150	CB	??		120-150 ft. (Unknown)



Well Construction Information

COMPLETION DATA

Hole Depth	: 150 ft. Below LS
TD Inside casing	: 154 ft. Below TOC

CASING, SCREEN & CAP

Material, joints	: PVC, threaded
Diameter	: 2 in. ID
Manufacturer	: LAIBE
Screen type	: Slotted
Screen length	: 10 ft.
Screen opening	: 0.020 slot
Scrn. placement	: 140-150 ft. BLS
Sump	: None
Bottom Cap	: 0.5 ft PVC
Protector Casing	: Steel box
Lock Key #	: - -

SEALS & SAND PACK

Cement seal type	: Concrete
Cem't placement	: 0 - 3 ft. BLS
Grout placement	: - -
Annular seal type	: Bentonite chips
Seal volume	: __ bags, hydrated
Seal placement	: 3-138 ft. BLS
Sand pack type	: 8/16 Oglebay silica
Sand volume	: __ bags
Sand placement	: 138-150 ft. BLS
Lower Annular seal	: - -
Seal placement	: - -

ELEVATIONS

Ground elevation	: Approx. 4025 ft.
Inner casing, top	: - -

WELL INSTALLATION:
Drilled to 150 feet with 8 1/4" auger to determine lithology. Installed well with 10 ft. screen. __ bags 8/16 Oglebay-Norton sand to 138 ft., __ bags bentonite chips to 3 ft., hydrated. Cement mix to surface. Installed locking steel protection casing, stick-up approximatel 4 ft.

WELL DEVELOPMENT:

Notes:
Location northeast corner cell 5.
Sample lithology taken from existing deep well drilled to 120 ft. in 1999.

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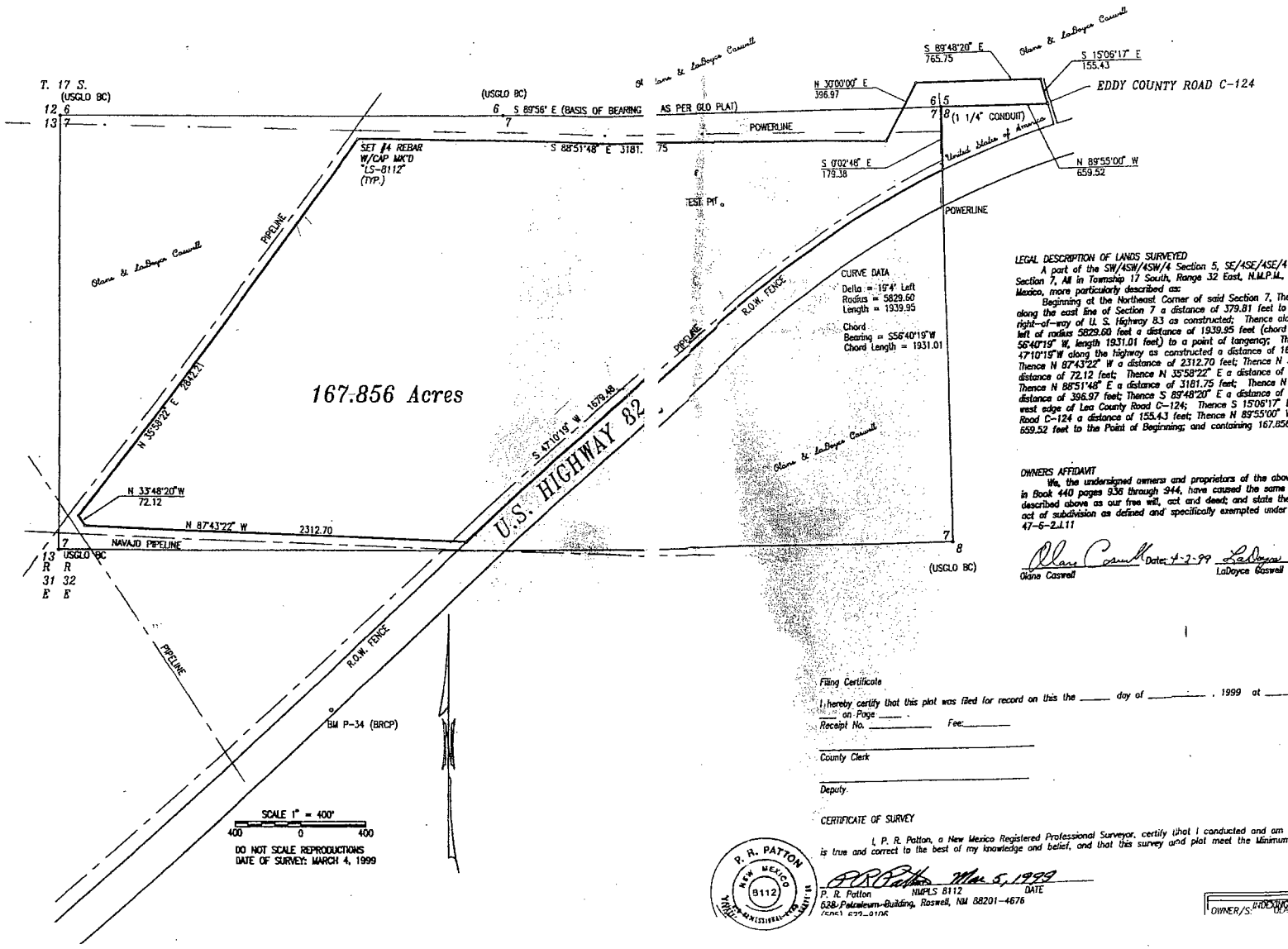
VIII. Appendix - Supporting Information

SURVEY OF ARTESIA AERATION COMPANY SITE IN SECTIONS 5, 6 AND 7, TOWNSHIP 17 SOUTH, RANGE 32 EAST, N.M.P.M., LEA COUNTY, NEW MEXICO



LEGAL DESCRIPTION OF LANDS SURVEYED

A part of the SW/4SW/4SW/4 Section 5, SE/4SE/4SE/4 Section 6, and N/2 Section 7, All in Township 17 South, Range 32 East, N.M.P.M., Lea County, New Mexico, more particularly described as:

Beginning at the Northeast Corner of said Section 7, Thence S 0°02'49"E along the east line of Section 7 a distance of 379.81 feet to the north right-of-way of U. S. Highway 83 as constructed; Thence along a curve to the left of radius 5829.60 feet a distance of 1939.95 feet (chord bearing S 56°40'19" W, length 1931.01 feet) to a point of tangency; Thence S 47°10'15"W along the highway as constructed a distance of 1679.48 feet; Thence N 87°43'22" W a distance of 2312.70 feet; Thence N 33°48'20" W a distance of 72.12 feet; Thence N 35°58'22" E a distance of 2842.21 feet; Thence N 88°51'48" E a distance of 3181.75 feet; Thence N 30°00'00" E a distance of 396.97 feet; Thence S 89°48'20" E a distance of 765.75 feet to the west edge of Lea County Road C-124; Thence S 15°06'17" E along Lea County Road C-124 a distance of 155.43 feet; Thence N 89°55'00" W a distance of 659.52 feet to the Point of Beginning; and containing 167.856 acres

OWNERS AFFIDAVIT

We, the undersigned owners and proprietors of the above lands as recorded in Book 440 pages 936 through 944, have caused the same to be partitioned as described above as our free will, act and deed; and state the same to be not an act of subdivision as defined and specifically exempted under NM Statute 47-6-2.J.11

Glorie Caswell Date: 4-2-99
Glorie Caswell

LaDoyce Caswell Date: 4-2-99
LaDoyce Caswell

Filing Certificate

I, hereby certify that this plat was filed for record on this the _____ day of _____, 1999 at _____ o'clock __M; and recorded in Survey Book _____ on Page _____.

Receipt No. _____ Fee: _____

County Clerk

Deputy

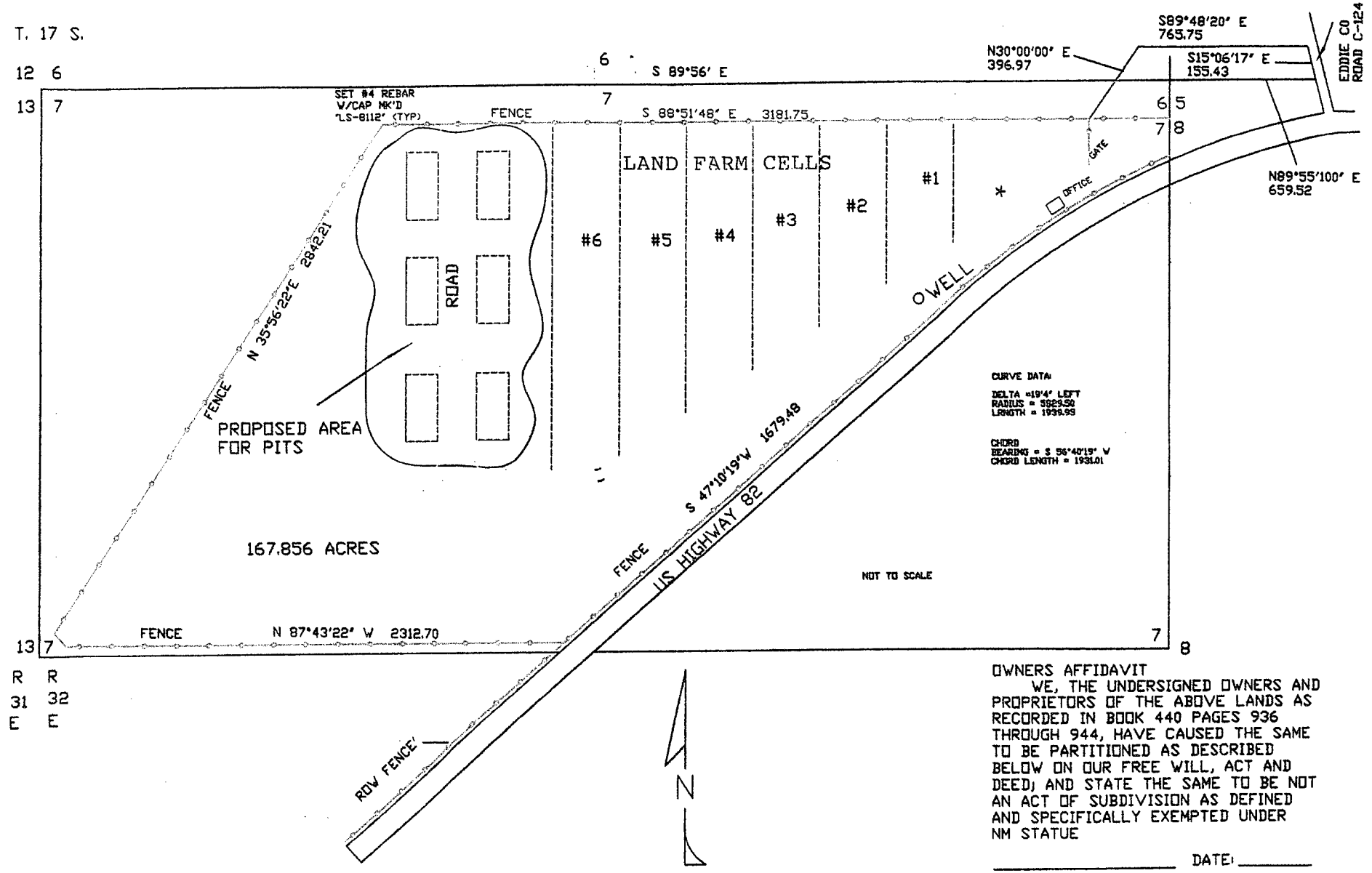
CERTIFICATE OF SURVEY

I, P. R. Patton, a New Mexico Registered Professional Surveyor, certify that I conducted and am responsible for this survey, that this survey is true and correct to the best of my knowledge and belief, and that this survey and plat meet the Minimum Standards for Surveying in New Mexico.

P. R. PATTON NEW MEXICO 8112 REGISTERED PROFESSIONAL SURVEYOR

P. R. Patton Mar 5, 1999
P. R. Patton NMPLS 8112 DATE
528 Petroleum Building, Roswell, NM 88201-4676
(505) 622-0106

RECORDING INFORMATION FOR LEA COUNTY CLERK
OWNER/S: GLORIE & LaDOYCE CASWELL BK 440 PGS 93



OWNERS AFFIDAVIT

WE, THE UNDERSIGNED OWNERS AND PROPRIETORS OF THE ABOVE LANDS AS RECORDED IN BOOK 440 PAGES 936 THROUGH 944, HAVE CAUSED THE SAME TO BE PARTITIONED AS DESCRIBED BELOW ON OUR FREE WILL, ACT AND DEED; AND STATE THE SAME TO BE NOT AN ACT OF SUBDIVISION AS DEFINED AND SPECIFICALLY EXEMPTED UNDER NM STATUE

_____ DATE: _____

ARTESIA AERATION LLC

*New Monitor Well drilled 5-14-05

GPS #	ARTESIA AERATION LLC LAND FARM	SECTIONS 5, 6 AND 7
32°-51'-17.1"N		TOWNSHIP 17 SOUTH, RANGE 32 EAST
103°-47'-56.9"W		N.M.P.M., LEA COUNTY, NEW MEXICO
ELEVATION: 4039		PHOENIX ENVIRONMENTAL

Revised June 1972

STATE ENGINEER OFFICE

WELL RECORD

Section 1. GENERAL INFORMATION

(A) Owner of well Artesia Aeration LLC Owner's Well No. _____

Street or Post Office Address P.O. Box 248

City and State Artesia N.M. 88210

Well was drilled under Permit No. _____ and is located in the:

a. _____ ¼ _____ ¼ _____ ¼ _____ ¼ of Section _____ Township _____ Range _____ N.M.P.M.

b. Tract No. _____ of Map No. _____ of the _____

c. Lot No. _____ of Block No. _____ of the _____
Subdivision, recorded in Lea County.

d. X= _____ feet, Y= _____ feet, N.M. Coordinate System _____ Zone in the _____ Grant.

(B) Drilling Contractor C&R DRILLING License No. 763

Address 7217 ROSWELL HWY. ARTESIA N.M. 88210

Drilling Began 5-12-99 Completed 5-13-99 Type tools Rotary Size of hole 7½ in.

Elevation of land surface or _____ at well is _____ ft. Total depth of well 120 ft.

Completed well is ☒ shallow ☐ artesian. Depth to water upon completion of well 0 ft.

Section 2. PRINCIPAL WATER-BEARING STRATA

Depth in Feet		Thickness in Feet	Description of Water-Bearing Formation	Estimated Yield (gallons per minute)
From	To			

Section 3. RECORD OF CASING

Diameter (inches)	Pounds per foot	Threads per in.	Depth in Feet		Length (feet)	Type of Shoe	Perforations	
			Top	Bottom			From	To

Section 4. RECORD OF MUDDING AND CEMENTING

Depth in Feet		Hole Diameter	Sacks of Mud	Cubic Feet of Cement	Method of Placement
From	To				
0	20	7½"	1qel		By hand

Section 6. LOG OF HOLE

Depth in Feet From	Depth in Feet To	Thickness in Feet	Color and Type of Material Encountered
0	25	25	Sand
25	40	15	Green clay
40	110	60	Red clay & caliche
110	110	10	Caliche
110	120	10	Red clay & green clay

Section 7. REMARKS AND ADDITIONAL INFORMATION

Monitaring Hole